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THE EVOLUTION OF THE WORLD RUBBER SITUATION

By H. STUART HOTCHKISS

I

UNLIKE iron, copper, and cotton, which have been important commodities for centuries, the development of the rubber industry with the consequent demand for the raw material has all taken place within the past 80 years. The great growth, however, has been in the past few years, the period during which the automobile has come into so much prominence.

The table on the following page will give an idea of the rapid increase in consumption of rubber, also its sources and the average prevailing prices.

Next to the increase in consumption during the past decade, the most significant change is the source from which the world's supplies are now derived. Had it not been for the development of plantations, which necessarily had their beginning some six years before the great demand developed, the evolution of the motor car could not have been as sensational as has been the case.

Before discussing the evolution of the world's rubber markets and the present crude rubber situation, it is necessary, in order to present the picture in a proper setting, to review a bit of the early history of the industry.

Prior to the discovery of vulcanization by Goodyear in 1839, rubber was used only to a comparatively slight extent. According to the Introductory Notes of the *United States Census Report of 1870,* "Caoutchouc was first made known to Europeans by the French academicians sent to Brazil in 1730. One of these, M. de la Candamine, in 1736 presented to the Academy of Sciences an account of its use by the natives of South America. In 1761 MM. Herissent and Macquer made a report, accompanied by samples, to the French Government, and by its order M. Grossart made a number of experiments in which he at length succeeded in drawing caoutchouc into tubes. The results were published in 1798. About the same time, it was used to make ex-

tensive ligatures and springs of different kinds. Fourcroy discovered its partial solubility in ether and in 1820 Nordler cut it into threads suitable for the manufacture of elastic tissues. The first English work in which this substance is mentioned is that of Dr. Priestley, on the *Theory and Practice of Perspective*, printed in 1770, in which he states that after the printing of his book he was shown 'a substance excellently adapted for wiping out from paper the marks of

WORLD'S PRODUCTION AND SHIPMENTS OF CRUDE RUBBER 1836-1922

	Year	Amazon	African, Centrals and Other Wild	Total Wild	Plantation	Grand Total	Average Yearly Price (Per Pound) Fine Para‡	Ribbed Smoked Sheet†
Boots, Shoes Mechanical	1836	186					$0.050	
	1840	381					**	
	1850	1,440					**	
	1860	2,618					.618	
	1870	6,484					.987	
	1880	8,525					.850	
	1890	16,102					.838	
Bicycle	1900	26,271	27,615	53,886	4	53,890	.982	
	1901	29,750	25,095	54,845	5	54,850	.850	
	1902	28,040	24,292	52,332	8	52,340	.727	
	1903	30,540	25,489	56,029	21	55,950	.905	
	1904	30,097	31,980	62,077	43	62,120	1.088	
	1905	32,869	29,131	62,000	145	62,145	1.243	
	1906	34,147	31,553	65,700	510	66,210	1.213	
Automobile	1907	36,844	31,156	68,000	1,000	69,000	1.063	
	1908	37,384	26,216	63,600	1,800	65,400	.871	
	1909	38,748	27,252	66,000	3,600	69,600	1.481	
	1910	43,547	25,753	69,300	8,200	77,500	1.908	$2.066
	1911	41,673	25,720	67,393	17,487	84,880	1.110	1.413
	1912	48,767	24,581	73,348	31,935	105,283	1.052	1.216
	1913	43,450	21,212	64,662	59,989	114,651	.807	.820
	1914	39,643	8,448	48,091	69,996	118,087	.616	.653
	1915	42,924	11,946	54,870	103,300	158,170	.557	.657
	1916	41,218	13,265	54,483	144,663	199,146	.669	.725
	1917	42,453	12,493	54,946	198,979	253,925	.648	.722
	1918	28,232	6,796	35,028	159,734	194,762	.549	.601
	1919	41,147	11,529	52,676	317,132	369,808	.483	.487
	1920	27,976	6,155	34,131	372,702	406,833	.333	.363
	1921	20,171	5,000*	25,171	297,630	322,801	.197	.163
	1922	26,696*	5,000*	31,696	377,786	409,482	.199	.170

*Partially estimated.
**No data.
‡Fine Para shrinkage averages 18%.
†Plantation Ribbed Smoked Sheet shrinkage ½ of 1%.

SOURCES

Shipments:

1836-1890 Amazon: Pearson, Henry C., RUBBER COUNTRY OF THE AMAZON. 1911, pp. 214, 215.

1900-1910 Amazon: Pearson, Henry C., RUBBER COUNTRY OF THE AMAZON. 1911, pp. 214, 215.
African, Centrals and Other Wild: Rickinson's WORLD'S RUBBER POSITION. June, 1923, p. 16.
Plantation: Rickinson's WORLD'S RUBBER POSITION. June, 1923, p. 16.

1911-1922 Compilations by Commercial Research Department, United States Rubber Company, from official Government sources giving exports of crude rubber from all producing countries.

Prices:

1836 Pierce, Rev. Bradford K., TRIALS OF AN INVENTOR. 1866, p. 136.

1860-1889 U. S. Department of Commerce Summary of Commerce and Finance for July, 1902, p. 100.

1890-1921 U. S. Department of Labor, Bureau of Labor Statistics, wholesale price series Bulletin Number 320, WHOLESALE PRICES, 1890-1921, pp. 238, 239. Commercial Research Department, United States Rubber Company.

a black lead pencil.' It was sold by Mr. Nairne, a mathematical instrument maker, at the rate of three shillings for a cube of about half an inch. From that time it appears to have taken the name of India Rubber, in reference to that use of it. Ten years later it had come into more general notice and was sold in the shape of bottles, at about a guinea an ounce. A Scotch publication, in 1791, contained an article 'On the uses that may be made of caoutchouc, elastic gum, or India-rubber, in the arts and manufactures, with an account of the manner of obtaining and manufacturing it.' Its application to a great number of its present uses was therein foretold and recommended, although the substance was then little used except as an amusing toy or to erase pencil marks."

The first really practical application of the knowledge previously gained by scientists was by a Mr. MacIntosh of Glasgow, who took out a British patent in 1823 and whose name is still quite generally applied to the waterproof garments that he developed.

In the United States a patent was issued in 1813 to one Jacob F. Hummel, of Philadelphia, for a varnish or elastic gum. This and other patents issued between then and the time that vulcanization was discovered indicate that rubber was receiving interested attention here as well as in Europe.

After Goodyear's discovery, the first considerable demand for crude rubber was brought about by the establishment in the 1840's and 1850's of the rubber shoe mills in New England and the factories for the manufacture of mechanical goods which followed rapidly, both in England and the United States.

The following table well indicates the growth of the American industry from 1849 to 1921, the last year for which the United States Government has published figures. Beyond doubt in 1922 the value of products, which receded sharply in the post-war depression of 1921, again approximated the billion dollar mark.

GROWTH OF THE AMERICAN RUBBER INDUSTRY FROM 1849 TO 1921

YEAR	NUMBER OF ESTABLISHMENTS	CAPITAL	VALUE PRODUCTS
1849	34	*	$ 3,024,335
1859	29	$ 3,634,000	5,768,450
1869	56	7,486,600	14,566,374
1879	104	8,974,000	25,310,000
1889	167	27,125,000	42,854,000
1899	301	71,169,000	99,881,000
1904	265	86,808,000	148,015,000
1909	267	162,144,564	197,394,638
1914	342	267,671,422	300,993,796
1919	477	960,070,726	1,138,216,019
1921	496	*	704,903,133

*No data.

SOURCES

1849-1869 CENSUS OF THE UNITED STATES 1870, Table X, p. 600.

1879-1921 CENSUS OF MANUFACTURES, 1921, "The Rubber Industry," pp. 10, 11, 19.

With this brief summary of the creation of demand, let us now turn to the evolution of the crude rubber markets of the world as they have developed to provide for the constantly increasing necessity for the raw material.

II

In the early days, manufacturers were dependent on the small quantities of rubber brought principally from Para and other Amazon River ports but also from Africa and Central America by traders and ship captains who obtained it in exchange for cotton goods, hardware, rifles, and other merchandise. Enterprising firms, however, rapidly saw a greater opportunity for profit through organization and these began to initiate and finance regularly organized expeditions into the interior. The practice, both in South America and in Africa, was very much the same and many of these early merchants amassed large fortunes while they had the field

to themselves. Gradually, owing to competition, profits became more uncertain and not infrequently traders, who bought in South America and on the West Coast of Africa, were obliged to sell their rubber at a loss on its arrival in the United States or Europe.

The whole history of rubber has indicated a tendency to a wide swing—from a feast to a famine and back again. In the early days when wild rubber was the sole source of supply and the total tonnage comparatively small, this movement naturally led to the organization of secret pools to regulate buying and corners to speculatively control selling prices. Some of the earlier efforts in these directions have been admirably described in an article entitled "Can Rubber Be Controlled?" appearing in the October 1, 1922, issue of the *India Rubber World*. Now that plantation production has overshadowed wild rubber in the ratio of about 93% to 7%, other plans for regulation have been devised, but this time not so much in the interest of speculation as to protect the economic position, both for producer and consumer. On November 1, 1922, the so-called Stevenson Restriction Plan, to which reference will be made later, came into force.

Such wild rubber as still comes on the market is handled very much as it was 50 years ago, but it has sunk into a position of relative unimportance (and need hardly be considered from a practical standpoint). Receivers at the primary ports continue to sell their product to New York and European importers who, in turn, send their representatives with offerings to manufacturers. These offerings include not only the old standard Up-River and Island grades of Fine Para, which arrive in the same form and are coagulated by the same crude methods that have been in vogue from the beginning, but also innumerable off-grade rubbers, the intrinsic values of which are known only to dealers and manufacturers who are by no means in unanimous agreement as to their relative merits. Before the era of plantations great experience was an absolute essential to success; today, with the virtual disappearance of wild rubbers, the whole market has become, generally speaking, standardized on established lines of plantation grades, so that there is no longer the same necessity for a buyer to be an expert judge of qualities. Rubber Association rules and arbitrators are available for his protection in all the markets of the world.

In 1905, although American manufacturers consumed only 46% of the world's rubber (which was then all wild) as against 75% today, there was no such predominant world market as has since developed in London. This is because approximately 80% of the world's rubber is now British controlled through financial interests in plantations. Prior to 1905 New York and London were of about equal importance as markets through which virtually all of the output of the Amazon passed. New York was the center for Mexicans and Centrals; Antwerp, for the Belgian Congo grades; Lisbon, for the rubber coming from the Portuguese Colonies; while Bordeaux received most of the output of French Equatorial Africa, and Hamburg that from German Africa. With the development of the Plantations, it is no longer necessary for the important firms in New York and London to maintain direct touch with these Continental cities, although many still have their correspondents through whom such wild rubber as is still available finds its way to the ultimate consumer.

Before reaching the manufacturer,

rubber usually passes through various hands—in London, the importer, the broker, and the dealer; in New York, the importer, the dealer, and the broker.

The London market differs from the New York market because a large proportion of rubber produced is shipped to the head offices of plantation companies which are domiciled there. These companies, or their agents, usually turn this rubber over to a broker for sale at a price fixed by the owner. The broker receives 1% on the value of all transactions consummated by him as his commission, in return for which he guarantees buyer or seller and attends to all of the handling, delivery, and collections. In London, when rubber is not shipped direct to the plantation company, it is brought in by independent importers who, likewise, utilize the services of the brokers on the same terms. The broker (prevented by association rules from approaching the manufacturer direct) sells to the dealer and "outsiders" or speculators, who, although middlemen, fulfil a useful purpose, because while consumers are not regular buyers in the daily market, they are. The London and New York dealer is the man who largely creates the market, for he is always in a position to relieve the importer who prefers to sell his consignments upon arrival. In New York the terms "importer" and "dealer" are usually synonymous. The broker, if utilized, sells direct to the manufacturer, receiving a commission of ¼ of 1% for his services which do not include guaranteeing any credit risk. In handling transactions between dealers, the broker's commission is reduced to ⅛ of 1%.

Until the beginning of the war in 1914, all importations of rubber into England, with the exception of Para grades, were sold by the brokers at public auctions which occurred fortnightly. These public sales were established for other commodities before the importation of rubber became of any volume, and were a guarantee to the foreign shipper that his consignee at London obtained the best market prices of the day. The procedure in handling, sampling, grading, and cataloging the offerings to be presented at auction was the same then as it is today. The auctions gradually grew, owing to increased imports of plantation rubber, until in the early part of 1914 it took four or five days of public sales to deal with the catalogs. Then, there was practically no trading in fresh arrivals between the auctions. It became apparent about this time that, although it might be desirable to offer wild rubber in public auction, because of the various buyers having different ideas in regard to the value, it was not at all necessary to catalog and sell by public auction standard grades of plantation rubber which were recognized by name as regular in quality.

Following the outbreak of war there were several months of business stagnation during which scarcely any bids were made in public auctions and this hastened the conclusion. In the early part of 1914 the fortnightly London auctions totaled from 1,200 to 1,500 tons and this quantity consisted of several hundred different lots, averaging probably not more than half a ton each. After the discontinuance of the public sales, trading became much more free—brokers were able to sell parcels at any time to any buyer without waiting a fortnight to submit lots in the public auction. This proved a welcome latitude of action and it is now improbable that plantation auctions will ever be resumed in London. Today all rubber, upon arrival, is required to be placed in

a licensed warehouse where a corps of expert samplers and graders examine and sample the various parcels. These samples are inspected in the different brokers' salesrooms, and dealers and manufacturers alike buy on description —Standard Quality 1st Latex Crepe or Smoked Sheet. The description is the same in London, Singapore, and New York, although the standards vary slightly, London being the most rigid.

The agents of estates, with headquarters in London, or the importers, now take the place of the old wild rubber merchant or trader of yesterday and they control and instruct the brokers at what price and when to sell their consignments; otherwise the procedure is precisely the same as existed in the old days.

The development of the now important markets in the East is largely a result of the war, when it was difficult to obtain shipping accommodations to England and America. At that time several large American consumers began to buy their supplies in the primary markets of Singapore and Colombo, and it was not long before these centers had also inaugurated a weekly auction on the same basis that used to be in vogue in London. These auctions still take place and serve a very useful purpose and will probably be continued. They may almost be termed necessary because, besides European estate rubber, there is a large amount of native rubber to be sold, also certain European-controlled estates prefer to sell their rubber, or part of it, ex store in the East rather than to pay the cost of shipping to Europe or America. Today the large American companies maintain buying offices in Singapore and Colombo, while all of the important dealers, both British and American, are represented there, either through their own organizations or by agents. Aside from the rubber passing through these Eastern auctions, much business is also transacted there privately.

It is not economically sound for rubber coming to the United States physically to pass through London, wherever the sale may be negotiated. There is the added freight and the expense of rehandling, to say nothing of additional fees and commissions to agents. London is naturally anxious to maintain its supremacy as the world rubber market, and to overcome some of the practical obstacles it is now common for sales to be made in London, calling for direct shipment of the rubber c. i. f. Singapore or Colombo to New York. This rubber is bought on description in London and the quality is guaranteed by the London broker.

Until plantation rubber overshadowed all other grades, there were monthly public auctions in Antwerp, Bordeaux, and Amsterdam, consisting chiefly of wild rubbers, the most important being the Antwerp sales of Congo grades. The auctions in these cities were not conducted as in London, Singapore, and Colombo. Catalogs were issued by the various brokers to likely buyers, as elsewhere, containing a description and valuation of the parcels to be offered, but any prospective buyer was obliged to send in sealed bids for his requirements to be opened on the day of the auction. This was in marked contrast to the British system of open bidding. The Continental auctions were styled "Inscription Sales" and perhaps in a sense benefited the importers by insuring that anyone requiring a specific lot would put in the very highest bid possible, but they were never popular with the large consumers.

Up to the present time rubber has always been dealt in as a solid; conse-

quently, the recent discovery that it can be used to great advantage in its original latex form is both interesting and significant, portending many possible changes in existing practice. By the addition of a small percentage of ammonia, latex can be kept from coagulating for an indefinite period, making it entirely feasible to transport it from the plantation to any country in the world. Already the United States Rubber Company, which has been a pioneer in this development, is bringing in latex in steamers' tanks and transferring it in tank cars to its various factories where it is utilized on an ever-increasing scale. As yet no established market has been created for rubber latex and all contracts have been subject to special negotiation, price being determined by the solid content, which averages about three pounds to the gallon, and the market for the standard product at London.

III

The word's rubber position as it exists today is a fascinating study. The consumption in 1923 will approach 420,000 tons—about 300,000 tons of which will be absorbed by the United States. Of this, 93% is derived from approximately 3,500,000 acres of plantations in the Middle East.

During the post-war slump of 1921-1922, much young acreage came into bearing for the first time which, coupled with a curtailment in demand, led to such low prices that not only no new planting was undertaken to provide for the future, but many old estates were forced to operate at a loss, while some few were actually abandoned.

Under the leadership of the Rubber Growers' Association, efforts were made voluntarily to curtail production on the estates, but this was found to be ineffective. As a result of necessity, therefore, the British Colonial Office recommended the so-called Stevenson Plan of enforced restriction of export to the Colonial Governments having direct jurisdiction and this was adopted. Unsuccessful efforts were made to induce the Dutch Government to take similar measures but these having failed, the British decided to undertake the burden alone. Without going into the many details of the Stevenson Plan, it is sufficient to say that the Act might very properly be called one of regulation rather than restriction, as its object is to stabilize prices on a basis calculated to save the existing plantation industry from ruin and to attract new capital to provide for ever-increasing demand. This latter phase is, of course, very much in the interest of the consumer.

Under the Stevenson Plan, October 31, 1919, to November 1, 1920, is taken as the period of standard production, taking into consideration the various ages of trees. Each plantation is permitted to export up to 60% of its rated standard at a minimum duty. This minimum duty is 1 penny in the Federated Malay States and 2½ rupee cents, plus an extra ¼ cent administration charge, in Ceylon. If the average London selling price for market standard grades ranges between 1 shilling and 3 pence a pound and 1 shilling and 6 pence a pound in any quarter 5% extra, or 65% of rated production, may be exported. If the price averages 1 shilling and 6 pence, or over, the increase permitted at the minimum duty is 10% each quarter instead of 5%. Conversely, if the price declines, exports are restricted 5% or 10%, as the case may be.

Much of the adverse criticism, both in America and abroad, directed against

the Stevenson Act has been due to a lack of knowledge as to the real cost of producing rubber. For this, British companies themselves are largely to blame in trying to present favorable reports to their shareholders. It has not been customary in reporting the f.o.b. cost to include depreciation of trees and interest on capital for the six initial, unproductive years of planting and, considering the risks of tropical agriculture, it is also fair to add a profit of 15% on the investment—no smaller return would tempt investors. If all this is considered, a price of 35 cents a pound in America or Europe is not exorbitant, at least until such time as budding, seed selection, or other scientific planting methods have substantially increased the present average yield per acre, which may now be taken at 350 pounds on areas seven years old. With the market ruling below this level, experience has shown that new capital cannot be readily attracted.

While the Stevenson Plan may be condemned as interfering with the economic laws of supply and demand, the fact remains that the alternative of doing nothing might well be far more serious. If, as is quite likely, a shortage of rubber develops in the next few years, it will be primarily due to the hiatus created as a result of stopping planting during the period of low prices and not to any present restriction. There is little doubt but that as conditions warrant, pressure exerted by British planters will force a return to normal production at the earliest possible moment, for it is indeed galling to them to see earnings curtailed while plantations in the Dutch possessions continue to operate at maximum capacity with corresponding profits.

It was agreed by joint committees, appointed by the Rubber Association of America, Inc., and the Rubber Growers' Association of London, which met in January, 1923, that normal world's stocks of rubber should properly be considered as approximately eight months of the world's annual consumption. Stocks on December 31, 1923, it is estimated, will amount to about 270,000 tons. Consumption in 1923 is estimated at 420,000 tons. On this basis stocks at the end of the year will be 10,000 tons below the figure agreed upon as normal, which condition should indicate a probable price level warranting the release of additional amounts of rubber at present controlled by restriction.

The table on the following page gives an estimate of the world's production and consumption in 1923, as compared with the corresponding figures for 1922. From these it will be seen that in 1922 approximately 67% of the rubber came from plantations in British territory and 25% came from those located under the Dutch flag. The figures also emphasize the predominant importance of the United States as a consumer.

Of late one has heard much of the well-advertised slogan "America Should Produce Its Own Rubber." This makes a strong sentimental appeal, but unless applied in a practical way, any attempt to realize such an ideal may prove dangerous and lead to heavy financial losses on the part of those who are not thoroughly informed regarding the difficulties of accomplishment.

The United States Department of Commerce is at present engaged in making a complete survey of the whole crude rubber situation, with the object of determining the practicability of growing rubber economically in the Philippines, South and Central America, and Mexico, as well as investigating actual costs of production in the coun-

tries on which the world is now dependent. This report will also show the maximum supplies available from present planted areas and, taken in conjunction with an investigation as to the probable increase in world's consumption during the next seven years, now being undertaken by the Rubber Association of America, Inc., should furnish a very valuable index as to what the future holds in store.

The areas suitable for growing rubber, particularly Hevea or Fine Para on which the industry depends, are limited geographically and it is inconceivable that this tree can ever be grown within the confines of the United States. This being the case, the American industry must rely upon its own tropical possessions or foreign countries.

Up to the present, labor and land laws, together with the uncertain political future, have prevented capital from flowing into the Philippines. Shortage of low-priced labor and governmental insecurity have likewise discouraged investment in Latin America. British and Dutch colonies are well administered and property rights there are secure, taxation is not unduly oppressive and consequently, except for military considerations, there does not appear to be any sound reason why America is not safe in allowing the plantation industry to continue to develop along logical economic lines as it has done in the past.

In the meantime, insurance against any military contingency might be secured by the creation of a revolving rubber reserve in the United States, held either by manufacturers under Government supervision or by the Government itself. If this stock were equivalent to a year's supply, the carrying charges would not be excessively heavy, crediting against it the normal stocks always on hand in the country. In case of an emergency the Government could immediately place an embargo on all uses of rubber for luxury purposes, thereby greatly extending the position. This, together with an added use of reclaimed rubber, would tide the country over for a very considerable period. The details of such a plan as suggested would necessarily require much careful working out, but there appears to be no fundamental obstacle in the way.

EXPORTS OF CRUDE RUBBER FROM PRODUCING COUNTRIES

Country	1923 (Estimated)	1922
British Malaya	179,000	212,694
Ceylon	37,000	47,367
India	6,000	4,854
Borneo	4,000	3,750
Sarawak	3,500	2,634
Dutch East Indies	123,000	102,383
Indo China	4,500	4,104
Brazil	22,000	22,696
Other Wild	6,000	9,000*
TOTAL	385,000	409,482

ABSORPTION OF CRUDE RUBBER BY CONSUMING COUNTRIES

Country	1923 (Estimated)	1922
United States	300,000	296,266
United Kingdom	24,500	9,681
Canada	13,000	9,367
France	25,000	27,672
Italy	6,500	6,431
Germany, Austria, Russia	30,000	32,551*
Japan	11,000	16,581†
Holland and Belgium	2,000	——‡
Spain	3,000	3,000*
Scandinavia	2,000	1,709†
Australia	3,000	2,500*
TOTAL	420,000	405,758

* Partially estimated.

† Including Gutta-percha.

‡ Not shown since inclusion of scrap with crude would show excessive exports.

In conclusion, the writer ventures the opinion that there will never be more than a temporary shortage of rubber in the world, but as the cycle is long (six or seven years between planting and substantial productivity) the pendulum is certain to swing back and forth. Until synthetic rubber comes along to upset all calculations, the essential to secure adequate supplies for the future is a market price high enough to make planting profitable for reasonably efficient plantations. If this condition prevails, money will automatically flow to every tropical country that is economically able to compete in production and the world will have all the rubber that it needs.

CONSUMERS' BUYING MOTIVES

By MELVIN T. COPELAND

AS an introduction to a study of consumers' buying motives, I have made an examination of 717 advertisements in current periodicals. These included general magazines, women's magazines, and national weeklies. Although a survey of this sort could not be expected to reveal every buying motive that induces consumers to purchase merchandise, nevertheless it has indicated those motives to which appeals commonly are being made at the present time for the sale of goods for personal consumption. The study was confined to the buying motives of individual consumers; it did not cover the buying motives of industrial purchasers and other wholesale consumers.

Practically every manufacturer is constantly confronted with the following questions: What are the selling points of my product? What are the most effective sales arguments for my salesmen to use? What are the most promising appeals to use in advertising my product? To answer any of these questions satisfactorily, it is necessary to ask another: What are the motives that will lead consumers to buy the product? In other words, a "selling point" or a "sales argument" is effective only in so far as it succeeds in arousing a buying motive. The determination of the consumers' buying motives to which appeal should be made, consequently, is one of the keys to successful salesmanship and to effective advertising.

The most prevalent malady that afflicts numerous sales and advertising departments is *sales egotism*. The chief executive of a manufacturing company, his sales manager, and his advertising manager, thoroughly familiar with the product and its merits, almost inevitably tend to overestimate its salability. They recognize its good qualities with such great appreciation that they have difficulty in reminding themselves constantly that its merits are not equally apparent to those who are expected to purchase it. The necessity of keeping the consumer's point of view constantly in mind is a commonplace in salesmanship. Although almost universally recognized in principle, it proves to be far from easy to observe the rule in practice. As a matter of fact, in the 717 advertisements covered in this survey, there were 34 in which no appeal to a buying motive could be detected, even with liberal imagination. Among the others, there were several in which the buying motives were so obscure as to warrant suspicion that the buying motives which it was sought to arouse were, at best, only hazily recognized by those responsible for the advertisements.

It was decided to make this study of buying motives by an examination of current advertisements because that material was ready at hand; the time and expense involved would have been too great to warrant undertaking a comprehensive, general field survey among consumers. A field survey, furthermore, would not have yielded equally dependable results, because a majority of the buying motives of consumers are not rational motives, and in many instances dependable answers could not have been secured. The average consumer, for example, probably would not admit pur-

chasing an automobile from the motive of *emulation* or purchasing silverware from the motive of *social achievement;* but the frequency with which such appeals are used by experienced advertisers indicates that they are effective. Even though such a study of advertisements as has been made here cannot be final in the determination of all the buying motives which influence consumers in making their purchases, nevertheless it does represent the collective experience of a large number of advertisers. Whether these advertisers have made a careful study of buying motives or not, they certainly have learned from observation, in a general way at least, which motives are operative. The advertisements offer tangible evidence as to the motives to which appeals actually are being made in current advertising and sales practice.

In carrying on this study, the first differentiation of buying motives that became apparent was between primary motives and selective motives. A primary motive is one which imparts to consumers the major, initial impulse to purchase the kind of article offered for sale. In an advertisement of clocks, for example, in which the appeal centered on the point that such a clock is "one of the few truly permanent things that enter into home-making," the primary appeal was to the motive of *securing home comfort*—the desire to make the home more livable by the installation of an attractive clock. A selective motive, on the other hand, is one in which the aim is to divert the consumer's expenditure away from other brands of the same article. It does not recognize the fact that for most articles it is necessary to compete for the consumer's patronage, not only with other brands of the same article, but also with many other articles serving different purposes. The *economy in purchase,* or price, motive is an example of a motive that is selective. The average consumer does not purchase an article merely because it is cheap. First there must be a primary motive to purchase the article. Price then may come in to determine the choice between competing brands.

From the study of the advertisements covered in this survey, it was concluded that if the demand for any article is latent, appeals only to primary motives are appropriate. If the article is a new article or one for which the consumers have not felt the need, then the general objective in selling and advertising must be to arouse the desire for such an article before any attempt is made to influence brand selection; the consumer's expenditure must be diverted from other commodities or purposes. Even in the case of articles for which the demand is not latent, furthermore, it is unsafe to rely entirely upon selective motives.

Competitive advertising, in which appeal is made only to selective motives, is probably overlooking an elementary principle which seems to be as applicable to advertising as to other affairs of life. It is generally recognized that a person obtains more enjoyment from reading the newspaper critic's comments on the first night of the opera, when the reader himself has been present. Likewise, one usually obtains more enjoyment from reading the review of a book that he already has read than from other book reviews. One enjoys more thoroughly the account of a football game in the Sunday newspaper when he was present at the game than if he had not had the opportunity of witnessing it. Reasoning from the operation of this principle in other fields, the conclusion is to be drawn that in selling and advertising it is likely to be worth while to make use

of appeals to the primary buying motives that generally induce consumers to buy the article. The fact that a buying motive is generally familiar to consumers is a strong reason for making a definite appeal to it; the more familiar consumers are with the motive, the more they are likely to be influenced by an appeal to that motive; it is sound practice, therefore, even in highly competitive industries to include appeals to major buying motives in the sales plans and in the advertisements and not to confine the appeals to those motives that are solely or even chiefly selective. Numerous instances among the advertisements examined indicated that the specific recognition by the advertiser in his copy of the existence of a major buying motive tends to strengthen rather than to weaken any subsequent appeals that may be made to motives for brand selection.

Another classification of the buying motives found in the 717 advertisements studied became apparent after the results had been tabulated. This grouping is more basic than the distinction between primary and selective motives. The basic classification that finally was decided upon was to group the buying motives according to whether they were (1) instinctive, (2) emotional, or (3) rational.

The instinctive group includes such buying motives as *distinctiveness, emulation, gratification of the romantic instinct, maintaining and preserving health,* and *satisfaction of the appetite.* These motives have their origin in natural, inward impulses. They represent in large measure unconscious, involuntary, or unreasoning promptings to action.

The emotional group includes such buying motives as *pride of personal appearance, pride in appearance of property, cleanliness, pleasure of recreation,* and *securing home comfort.* These are conscious motives. Action is stimulated through these motives, however, not by an appeal to reason, but by an appeal to the conscious desire of the consumer to please his own personal feelings.

The rational motives are those which are aroused by an appeal to reason. This group includes such motives as *dependability in use, durability,* and *economy in purchase.* When these appeals are used, it is expected that the consumer will make his purchase only after reflection and the use of his reason.

I. Instinctive Buying Motives

1. DISTINCTIVENESS. In 27 advertisements, the major appeal was to the desire for distinctiveness, that is, the desire to manifest individuality in judgment or taste, or to display leadership in personal appearance or in the appreciation of new offerings. This motive is based on an inherent desire to obtain primacy, to excel, to "set the fashion." The appeal to this motive is made most effectively when stated, not baldly, but with subtle suggestion. It recognizes the desire of some consumers to have "something different" from their associates. The lady who purchases the newest Parisian style is influenced by the buying motive of distinctiveness. She wishes to be the first to wear that new style. The man who purchases a suit because the tailor has only one piece of that pattern is influenced by the desire to have something different. The family which buys an imported automobile is influenced, in part at least, by the motive of distinctiveness.

Among the advertisements that came within this group in the 717 studied was one of pearls, which were offered as "distinctively different." Another was

the advertisement of a merchant who based his appeal on the fact that he purveyed "distinctive shirtings." An advertisement of furniture centered its appeal on the selling point that "the color schemes may be selected to match with the interior decorations into a charming ensemble that is distinctly pleasing and out of the ordinary"; the fact that the merchandise was "out of the ordinary" made this an appeal to distinctiveness. A tone of distinction was employed in the illustration and text of many of the advertisements in this group, which it apparently was expected would carry an atmosphere of distinctiveness that the reader would wish to attain.

The articles, for the sale of which appeal to the buying motive of distinctiveness was made, generally were specialty goods. As was explained in an article in a previous number of the HARVARD BUSINESS REVIEW, "specialty goods are those which have some particular attraction for the consumer, other than price, which induces him to put forth special effort to visit the store in which they are sold and to make the purchase without shopping." Distinctiveness ordinarily is not characteristic of shopping goods—"those for which the consumer desires to compare prices, quality, and style at the time of purchase." It also cannot ordinarily be used effectively for convenience goods —"those customarily purchased at easily accessible stores." The appeal to distinctiveness carries with it an implication that the consumer is expected to be willing to go to the store where the distinctive merchandise is sold.

2. EMULATION. In 37 advertisements the primary appeal was to emulation. The purpose of the consumer who is influenced to make a purchase by the motive of emulation is to equal or rival his neighbors and associates in display, wherever the avenue of expenditure may lead. He wishes to show that he can "keep up" with them. One shoe manufacturer, for example, asserted: "In these four smart shoes, you find Fashion's choice for fall." A hosiery manufacturer stressed as one selling point: "Silk, the accepted fabric of elegance." A cosmetic manufacturer featured the use of his product by a famous stage beauty, the obvious implication being that the reader would wish to emulate that beauty. A trunk manufacturer stated: "Smart women ..... know they are judged by the *looks* of their luggage." A manufacturer of mustard stated that such mustard generally was requested "by the connoisseur of good foods." An automobile company used an appeal to the motive of emulation by referring to its product as "the modern woman's favorite car."

The motive of emulation usually was subtly suggested, and frequently the suggestion was conveyed by means of an illustration. The advertisements in this group included six for shoes, six for men's clothing and furnishings, five for women's garments, four for perfumery, lotions, and face powders, three for automobiles, two for hosiery, and eleven miscellaneous. In so far as this practice can be used as a guide, it indicates that the motive of emulation influences both men and women in making their purchases.

The motive of emulation was used for convenience, shopping, and specialty goods. It probably has its strongest appeal for shopping goods, in which the element of fashion enters, and for some specialty goods. Fashion, the prevailing mode or style in wearing apparel, is an especially good example of the buying motive of emulation. In fact, it is

more influential than these advertisements in national media indicated, for the continual series of fashion changes, particularly in women's wearing apparel, are not represented frequently in the copy of national advertisers. One of the peculiar characteristics of fashion is that its influence is largely independent of inherent beauty or durability. When fashion changes, apparel that still retains such inherent beauty as it originally possessed and that still is far from being worn out is discarded. It is supplanted by apparel of a new prevailing style, merely because the consumer wishes to be "in fashion," to "keep up" with others. A person influenced by emulation does not wish to be behind the fashion in her particular social group, and she does not have the initiative, judgment, and social influence to lead her to attempt to set a new fashion.

Every fashion, nevertheless, by its very popularity carries within itself the germ of its own destruction. The more rapidly it becomes popular, the sooner it will begin to be supplanted by another distinct fashion. Just as soon as the motive of *emulation* has made a fashion widely popular, the style leaders who are influenced by the motive of *distinctiveness* want no more of the popular fashion; it has become "too common"; they want something new. The uncertainty of this rate of change and the inevitable conflict between the motives of *emulation* and *distinctiveness* are two of the particularly powerful deterrents from more extensive national advertising of goods subject to rapid, seasonal changes in fashion.

3. Economical Emulation. Six advertisements were included in this group. Ordinarily, the appeal to emulation does not stress low cost or economy. At first thought, furthermore, cheapness seems inconsistent with emulation, for the latter frequently operates to prove, at least nominally, that the consumer can afford to "keep up" with his acquaintances, that he does not find it necessary to economize more than they do, that he is sufficiently successful financially to afford at least as good articles as they can afford. In several advertisements among those examined, however, the motive to which appeal was made was emulation, with an emphatic explanation as to how the result could be secured at economical prices. For instance, one fur company stated that its product was "the best imitation of the genuine article." An automobile company stated that its car "rivals the finest of custom-built cars ..... with a price far lower than you would expect to pay." Another automobile manufacturer stated that his product afforded "custom-built quality at a quantity price." A shoe manufacturing company stated that its product sold for $6 a pair, whereas "shoes like it sell for $10." Although the particular advertisements cited here may have been effective, on general principles one would expect that the appeal to this motive should be used sparingly. It involves the danger of overselling, whereas actual sales experience generally indicates that underselling is sounder policy than overselling, in that by the former the consumer is not led to expect more satisfaction than the product will yield.

4. Social Achievement. This motive aims at the achievement of distinction in social relationships by the manifestation of good taste in managing and participating in social affairs. There were nine advertisements placed in this group. One was for a book of etiquette, which offered instruction on how

to avoid social blunders. Another example was that of a silverware manufacturer, in which an attractive illustration that helped to arouse the motive was supplemented by: "Charming Memories. Her formal dinners—Luncheons at the club—Coffee on the terrace—*for two.*" In the advertisement of a writing paper manufacturer, the following statement stood out as the chief appeal: "The letter a woman writes shows her good taste as surely as will her hat or her home."

In all these instances the appeal was to the individual's desire for social achievement, not for *emulation.* The appeal to social achievement most commonly is applicable to specialty goods.

5. PROFICIENCY. The motive for attaining proficiency arises from the satisfaction that is felt in doing one's tasks well, and incidentally from the enjoyment of such credit as may accrue from a capable performance of the tasks. Ten advertisements were in this group. In most instances, they recognized the desires of particular groups of consumers to attain a reputation for being well skilled. Two examples of these advertisements suffice to illustrate this buying motive. In an advertisement of salad dressing the appeal centered on the explanation of the headline: "What all women *may be*—and some women *are.*" In an advertisement of macaroni and similar products, "new dishes" were advertised as "the *constructive* side of housekeeping."

6. AMBITION. The buying motive of ambition is the desire for personal advancement—personal gain or preferment. Appeals to ambition differ from the appeals to the buying motives of *social achievement* and *proficiency,* in that ambition carries with it a stronger idea of advancement. In arousing this motive, consequently, greater effort is made to inspire self-confidence and courage in the prospective buyer's mind. In the case of *social achievement* and *proficiency,* it is recognized that the prospective customer is at or near the top, one who readily can grasp the suggestions for achieving distinction either in social matters or in the skilful performance of tasks.

Seven advertisements fell under this heading. Three of them were saxophone advertisements, in which efforts were made to arouse social and pecuniary ambitions. Another example of an appeal to ambition was the one used by a shoe manufacturer, who stated that "big men who do big things" are aided to clear thinking and quick action by wearing comfortable shoes that facilitate the free circulation of blood in their feet. A negative appeal to ambition was found in the advertisement of a throat wash for a man as a corrective for the one thing which had "retarded his progress both in business and socially."

7. ROMANTIC INSTINCT. The buying motive of gratifying the romantic instinct was recognized in eight advertisements. One of these was an advertisement of incense: "A tiny wisp of incense, curling from a burner in your home tonight, can bring to you all the mystery, the beauty and the lure of Eastern Romance." In an advertisement of sterling silverware, the appeal was directed to the spirit of romance in the days just preceding marriage when the bride-to-be is selecting her furniture and silver. Four advertisements in this group were those of steamship companies, which sought to stimulate enthusiasm for enjoying the "golden romance" of the Orient, the "age-old

romance" of the West Indies, and the color and beauty of the "glamorous cities of the Mediterranean."

8. MAINTAINING AND PRESERVING HEALTH. This buying motive goes back to the instinct of self-preservation. It is universal and innate. Thirty advertisements apparently belonged in this group. Five of these were for dentifrices, three soap, three heating equipment, and nineteen miscellaneous. Negative appeals were used in one-third of these advertisements.

9. PROPER CARE OF CHILDREN. In 18 advertisements among those examined the appeals were to the desires of parents to assure their children of proper care, by such means as providing comfortable clothing and healthful food. This differs from the preceding motive in that it is based on the instinct of parental affection and the recognition of the duty of fulfilling parental obligations. In the advertisements in this group, six aimed to stimulate sales of children's wearing apparel, five food, three soap, two talcum powder, and two miscellaneous.

10. SATISFACTION OF THE APPETITE. This pertains to the inherent desire for food and drink, in order to provide nutrition and refreshment for the body. Where it is sought to arouse this motive, however, the emphasis is not on health or the necessity of sustenance, but upon the enjoyment of a good meal or an "appetizing" article of food or drink. The impressionistic type of copy was used with especial frequency in the 22 advertisements in this group. The most extreme example of the use of the impressionistic appeal was a full-page spread without text, which pictured an anxious ranchman who had lost a case of Jell-O on the railroad track, just as he was starting for home with a heavy load. The anxiety which he clearly displayed, as he hurried his stubby legs to snatch the package from under the oncoming train, conveyed a message that could not be mistaken.

11. PLEASING THE SENSE OF TASTE. When the appeal is made to this motive, the emphasis is on the flavor, the quality, or savor as perceived by the tongue, whereas *satisfaction of the appetite* is experienced through the digestive organs. *Satisfaction of the appetite* usually involves pleasant taste, but in 31 of the advertisements examined the appeal was made to taste alone. The advertisement of Lucky Strike Cigarettes, which stressed the "delightful flavor" because "it's toasted," used an appeal to the sense of taste. In a salad dressing advertisement, the buying motive that appeared was the "subtle, elusive charm of taste." For Aunt Jemima Pancake Flour it was stated: "No other cook could get *that same flavor* in pancakes."

12. ALLEVIATION OF LABORIOUS TASKS. Thirteen advertisements recognized the inherent desire of consumers to lessen the effort required to perform essential tasks, to "save labor," to mitigate the performance of disagreeable tasks, to secure relief from drudgery. Although the desire to avoid unnecessary labor is instinctive, nevertheless, it is noteworthy that efforts to arouse this buying motive were far less common than the use of *emulation* and *pride of personal appearance,* for example, as buying motives.

13. SECURITY FROM DANGER. To obtain security from danger, either to one's self or to one's family, is a nat-

ural desire to which appeal as a buying motive was made in nine advertisements, including two for automobiles, three for automobile accessories such as tire chains and head lights, two for insurance, and two miscellaneous.

II. Emotional Buying Motives

14. Pride of Personal Appearance. This is the buying motive to which appeal was made most frequently in the advertisements examined. Pride is closely related to *emulation,* but there are distinctions between the two motives which are of significance from the practical sales standpoint. Pride is self-esteem, the feeling of elation at having those things of which one is worthy, the satisfaction of making a good impression for one's own worth, or, more commonly, by one's appearance. In *emulation* the object is to make a good showing in comparison with others, to be "in fashion," whether or not that fashion is artistic and beautiful. In the appeals to pride, the notion of comparison with one's associates is pushed into the background and the emphasis is placed on the inherent attractiveness or worth of the results obtained. In marketing ladies' garments, for example, if the chief selling point is that they are fashionable, the buying motive aimed at is *emulation;* if the selling point is that they are beautiful, the buying motive is pride. *Pride* connotes independent appreciation; *emulation,* "keeping up" with others; *distinctiveness,* keeping ahead of others, or manifesting independence of taste. Although it well may happen that the satisfaction of pride results in a high degree of excellence in comparison with others, the object is sought for its own attractiveness, not because it excels in comparison. In one soap advertisement, the sales attack was centered on: "The charm of lovely hair"; in the advertisement of a cosmetic: "Your eyes tell the story of youth or years." A shaving soap was advertised as "a help to every man" in making a good personal appearance. In an advertisement of kitchen cabinets, an appeal to pride of personal appearance was accomplished through the headline: "Will your mirror tell a happy story tonight?"

Among the 71 advertisements in which pride of personal appearance was the major buying motive, sixteen were advertisements of cosmetics; twelve of hair treatments, including shampoos and accessories; eight hosiery; six corsets; six dentifrices, including five advertisements of a single company with different copy in each insertion; three underwear; three ladies' garments; two shoes; and fifteen miscellaneous. The advertisements in this group included a wide range of commodities, and among them were convenience, shopping, and specialty goods.

15. Pride in Appearance of Property. Pride in the beauty, charm, and attractiveness of one's possessions is a buying motive to which appeal was made in 31 advertisements. The home and the automobile were the types of property to which pride in appearance chiefly was applied as a buying motive. Well-kept floors, an attractive doorway, and decorative bookcases were examples of the objective sought in pride in appearance of property.

16. Expression of Artistic Taste. This motive was used only for promoting the sale of specialty goods. It appeared in 17 advertisements. The object of the consumer who desires to express artistic taste is not primarily to achieve *distinctiveness* or to satisfy

pride, but to enjoy art and artistic accomplishment, to obtain the satisfaction which comes to the possessor of that which is artistic. One furniture advertisement, for example, was addressed "to those who love furniture for its beauty of design and execution." A piano was "recommended for its incomparable tone"; an automobile for the "pure beauty of the new body lines." A silverware manufacturer advertised his product as: "Things you choose to last forever. . . . . You and your descendants will never weary of it." The advertisements in this group included five for pianos; four for silverware; three for furniture; and five miscellaneous.

The distinction between *emulation* and *expression of artistic taste* as buying motives has been manifested markedly in the automobile industry. When automobile manufacturers, about fifteen years ago, made radical changes annually in model designs, they were counting upon *emulation* to effect sales, the desire to be in fashion. As the policy of "style permanency" was developed, with infrequent changes in model designs, the buying motive relating to the design of the car was shifted to *expression of artistic taste.* The influence of seasonal styles as a buying motive is essentially different from that of enduring styles.

17. Happy Selection of Gifts. The satisfaction of choosing gifts that are appropriate to the occasion and pleasing to the recipient was the major buying motive in sixteen advertisements. Five of these advertisements were for silverware. The differentiation of this buying motive from the *expression of artistic taste* also is of fundamental significance, as, for example, in the formulation of the sales policy and the selection of designs by a silverware manufacturer. Although not of necessity mutually exclusive, the two motives tend to lead in different directions. If a silverware manufacturer, for instance, aims to sell his product chiefly for gift purposes, variety of patterns and novelty designs are likely to become prominent factors. When the object is to sell silverware to consumers for their own use, the *expression of artistic taste* —the appreciation of the beauty of the design—is uppermost in the sales plans; and novelty designs oftentimes are not the most beautiful designs. An attempt to combine appeals to both motives in the same advertisement, furthermore, ordinarily tends to cause confusion and lessens the effectiveness which each appeal would have if it were used independently.

18. Cleanliness. The result of cleanliness is better health, greater comfort, or more attractive appearance, but when cleanliness appears as a buying motive, the emphasis is on the means, not on health, comfort, or appearance. The desirability of accomplishing those results is taken for granted. Cleanliness, moreover, includes both personal cleanliness and home cleanliness. Among the nineteen advertisements in which the buying motive of cleanliness was used, five were for soap and cleaning compounds, four for tooth brushes, and ten miscellaneous, including such articles as an electric washing machine, insecticide, cold cream, and polishing wax.

19. Securing Personal Comfort. So far as can be judged from the frequency with which this buying motive appeared, it is second only to *pride of personal appearance* and *dependability in quality* as an effective means for increasing sales. The objective in secur-

ing personal comfort is to enjoy the contentment which flows from physical comfort. *Maintaining health* has as one of its purposes the securing of personal comfort, but with that in the health motive are merged such considerations as preservation of life, duty, necessity of protecting earning power, and family affection. Inasmuch as physical comfort frequently is used by itself as a buying motive, it is necessary to differentiate it from the motive of *maintaining and preserving health*. Personal comfort, furthermore, is a motive that can be aroused for buying numerous commodities that do not directly affect health. Under this same heading is included also the motive of securing relief from discomfort or pain, where the negative appeal commonly is used. Examples of appeals to the motive of securing personal comfort included a shaving cream, which was stated to afford a "good, smooth, comfortable shave"; rubber-soled shoes—"a new comfort in summer dress"; soap, which was said to "refresh and invigorate the skin"; kitchen sinks, which "provide comfort and prevent back-strain." The motive of avoiding discomfort or pain was appealed to chiefly for the sale of liniments, corn cures, and bunion treatments.

Forty-eight advertisements used the buying motive of securing personal comfort. Among these were seven advertisements of shoes; six of underwear; four of shaving cream; three of shaving accessories, such as brushes, razors, and strops; three of soap; and twenty-five of them advertised miscellaneous articles.

20. Pleasure of Recreation. Recreation is the refreshment of strength and spirits by pleasurable activity, and usually carries with it a connotation of enjoyment of the big outdoor world. In view of the obviously widespread popularity of recreation, of the enjoyment that millions of consumers obtain from recreation, it is surprising that this buying motive appeared in so few advertisements; it was used in only nine. Among automobile companies, the Jordan has stood out as one that has utilized especially the appeal to the pleasure of recreation. In the group of advertisements that were examined in this study, there was one Jordan advertisement which featured the headline: "A million miles from dull care." Another outstanding advertisement in this group was that of 3-in-1 Oil, to be used in keeping the camper's outfit working smoothly. Another was the advertisement of a canoe manufacturer. A shoe manufacturer utilized this motive by urging consumers to "make every walk a 'joy-hike.'"

21. Entertainment. Whereas recreation connotes refreshment and exhilaration, entertainment conveys the less active concept of diversion by the agreeable engagement of the attention. Entertainment includes various forms of amusement, such as indoor games, and also the serious, instructive use of non-working hours. There were seventeen advertisements in which the major purpose was to arouse the buying motive of entertainment. Seven of these advertisements were for music and musical instruments.

22. Obtaining Opportunity for Greater Leisure. Where the appeal to this motive is used, the desirability of leisure, whether utilized for rest, recreation, or entertainment, is taken for granted. Little or no reference is made to the use to which the leisure will be put; it is assumed that the

normal person welcomes greater leisure to be utilized as he may prefer at the moment. A manufacturer of floor coverings stressed: "Freedom from Work—Freedom for Leisure." For an electric washing machine patronage was solicited on the ground that: "A housekeeper's time may be very profitably invested in play, in visiting, and receiving friends, or in taking beauty naps." The manufacturer of an oven heat-regulating device suggested the desirability of its use on Thanksgiving Day, in order that all the members of the family might go to the local football game. The fifth advertisement in this group—there were only five in all—was that of an electric range, which embodied an automatic control that removed the necessity for watching the stove, and thus gave opportunity for leisure. From general observation, one would expect that the motive of obtaining opportunity for greater leisure would be more potent than is indicated by the small number of instances in which it appeared in these advertisements.

23. SECURING HOME COMFORT. This is the buying motive which arises from the desire of a person to make his home comfortable because of the pleasure which accrues from the comfort itself; it carries with it the concept of the quiet, personal enjoyment of one's home. This motive aims to enhance the "livability" of the home, rather than to take pride in its appearance. A chinaware manufacturer, for example, suggested to prospective patrons that they make their "rooms invitingly cheerful." In one of the advertisements of the American Radiator Company, its equipment was referred to as "the invisible host . . . . . whose genial presence permeates every room in the house." A manufacturer of draperies suggested that his product would make the home "livable and home-like." A furniture manufacturer advised the use of his product in order to provide "a home of charm, individuality, and livable comfort." There were twenty-two advertisements in this group; six were for heating equipment; four for furniture; two for clocks; and ten miscellaneous.

III. Rational Buying Motives

24. HANDINESS. In seeking to arouse this motive, emphasis is placed upon the means by which the result is to be accomplished rather than upon the result itself. The convenience of having the article ready at hand, its adaptability for numerous, varied purposes, and the avoidance of inconvenience are reasons advanced for buying a product that is "handy." Twenty-nine advertisements fell into this group.

In an advertisement of the Walworth Stillson wrench, it was stated: "For every car in any trouble, the Walworth Stillson wrench is—*a whole kit of tools.*" A Goodell-Pratt advertisement aimed to show how handy Mr. Punch was. A company manufacturing absorbent cotton pointed out that its product has "countless uses" and that it "absorbs twenty times its weight in moisture." A manufacturer of kitchen cabinets showed the "wonderful conveniences . . . . . built into it." An advertisement of Packer's Tar Soap, announcing a new metal container, made its appeal to the buying motive of handiness by showing the convenience of the container. Inasmuch as this was the first announcement of the container, the advertisement had real news value in this case. Ordinarily, however, the convenience of the container is not likely

to prove to be a powerful buying motive; a consumer usually buys an article for its own worth, rather than because of the incidental handiness of the container.

25. Efficiency in Operation or Use. As in the case of the buying motive of *handiness,* so in the motive of securing efficiency in operation or use, the emphasis is placed upon the means by which a desired result is accomplished rather than upon the result itself. Efficiency in operation or use covers such sales arguments as the smoothness or precision with which a tool or machine works, the facility with which the desired result can be accomplished. In the ten advertisements included in this group, three were for automobiles; two for vacuum cleaners; and five miscellaneous. Efficiency in operation or use was used as a supplementary buying motive in several other advertisements, but in these ten cases it was the major motive to which appeal was made.

26. Dependability in Use. Where this motive is used, an attempt is made to provide reasons which will assure the purchaser of the article that it will accomplish the object sought. It differs from *efficiency in operation or use* by giving emphatic recognition to the rerults that the use of the article is expected to produce.

Dependability in use was the primary motive appealed to in twenty-two advertisements, including five for automobiles, four for automobile equipment and accessories, four for watches, and nine miscellaneous. With only two exceptions, bluing and dyes, all the articles to which the buying motive of dependability in use was applied were specialty goods. The purpose of one automobile advertisement was to prove the "stable, steady performance" of that car. Each of the watch advertisements aimed to prove that that watch was accurate and dependable in performance. A burner for kitchen stoves was advertised as giving "exactly the degree of heat you want—slow, intense, or 'simmering.'"

In order to enhance the confidence of prospective purchasers of the article, in order to have its claims for dependability in use believed, a manufacturer frequently gives a guarantee of performance. One manufacturer of electric washing machines, no advertisement of whose product happened to appear among those examined in this study, gives a guarantee against defects in the product and also guarantees in at least one metropolitan district that the cost of electricity for operating the machine will not exceed two cents per hour. The maximum cost per hour is varied according to the cost of electricity in different communities. This is a guarantee of performance. When automobile tires were guaranteed to yield five, six, or eight thousand miles, that was a guarantee of performance. When a guarantee of performance is given, it is stated in detailed, specific terms, and from the sales standpoint it is offered as a reason for confidence in the dependability of the article in operation.

27. Dependability in Quality. When a consumer is influenced by this buying motive, he is seeking assurance that he is purchasing an article the quality of which is uniformly maintained. This dependability usually results from the care exercised in production, and the reputation achieved by the producer or the magnitude of his operations frequently is cited as assurance of dependability in quality. One of the chief reasons for the large increase in

the sales of package goods in recent years has been the desire of consumers to secure dependable quality.

Dependability in quality is used almost solely as a selective motive, to induce preference for one brand over competing brands. Institutional advertising, which aims to build up the prestige and reputation of a manufacturer, undertakes to establish, by implication, confidence in the dependability in the quality of the product. A few examples of the buying motive of dependability in quality are the following: A manufacturer of soups explained that real cream was used in his cream soups. A canned milk producer stated that his product was "absolutely pure." Coffee was advertised on the strength of its "reputation." In eight advertisements of automobile tires, the chief object apparently was to prove that each brand was dependable in quality. Although in fifty-two advertisements the chief buying motive that could be detected was dependability in quality, this group was something of a "catch-all" for advertisements which had no other definite motive, but which did seem to have the concept of dependability in quality at least hazily in the background.

Whereas a specific guarantee of performance occasionally is used to support the buying motive of *dependability in use,* a guarantee of quality is sometimes used to support the reasons advanced for confidence in the quality of a brand. When the tire manufacturers gave up the mileage guarantee and substituted therefor a guarantee against imperfections, they supplanted a guarantee of performance by a guarantee of quality. A guarantee of quality usually is stated in general terms and sometimes for a limited period, as in the case of an automobile which is guaranteed against defects for a period of three months. Whether or not a guarantee of quality is given as a support for this buying motive, a reputable manufacturer who wishes to protect his brand reputation and good-will must, in fact, stand behind his product and make restitution for any defective articles bearing his brand that reach the hands of consumers. Even with careful factory inspection, such defects are almost certain to appear from time to time, and the consumer naturally expects restitution. A guarantee of quality, however, has less positive sales force than a guarantee of performance.

28. Durability. Durability is another selective motive; it stresses the resistance of the article to wear and tear and its length of life. Durability carries with it an implied *dependability in use* during the expected period of life of the article, and also commonly connotes economy in maintenance. It is, in effect, a composite motive, but one that is used frequently enough to justify differentiation from other buying motives. Among the thirty-seven advertisements in which the chief appeal was to the buying motive of durability, six were for hosiery, four for automobiles, four for automobile tires, three for paint, and twenty miscellaneous.

29. Economy in Use. In contrast to *economy in purchase,* economy in use is a primary buying motive. The object of the consumer in purchasing an article from this motive is to reduce the amount that otherwise would be expended for other purposes. The reason given for buying one brand of oil stove, for example, was that that stove "saves one-fourth of your fuel." The purchase of metal weather strips was advised, in order to "save fuel." In an advertisement of motor oils and

gasoline, it was pointed out that: "A fine engine in a fine car signifies an investment to be conserved." This buying motive appeared in nineteen advertisements.

30. ECONOMY IN PURCHASE. This is another selective motive, because the price differential between competing brands is considered only after deciding to buy the type of article; price as a sales argument ordinarily is a reason for brand selection. This stood out clearly in the thirty-two advertisements in which this motive appeared, and this conclusion also has been substantiated by numerous field surveys for advertising purposes. Price was the chief appeal in nine automobile advertisements.

General Conclusions

From a study of a substantial number of typical advertisements, such as were covered in this survey, several conclusions can be drawn that are directly applicable to the training of salesmen and the formulation of advertising plans.

The strongest appeals ordinarily are those which arouse or recognize primary buying motives, not merely selective buying motives. When a piano manufacturer, for example, as happened in several of the advertisements covered in this study, stresses the reasons why the piano that he manufactures should be preferred to other makes, his appeal will influence at most only those consumers who already are at the point of buying a piano. He overlooks many other consumers who might be influenced by an appeal to an emotional buying motive which would impart to them the initial desire to possess a piano.

It is noteworthy that in the advertisements examined in this survey the negative appeal was used in only a small number of cases. In one-third of the advertisements in which the buying motive was *maintaining and preserving health*, the negative appeal was used. It also appeared in three advertisements in which *cleanliness* was the buying motive and in four advertisements which urged consumers to obtain *security from danger*. The negative appeal also was used in a few scattered advertisements which illustrated other buying motives. The negative attack aims to arouse the instinct of fear. It may be effective temporarily, but fear is not normal in healthy persons; hence, the appeal to positive buying motives apparently has in most instances been found to be more effective.

Efforts to arouse instinctive, emotional, and rational buying motives should not be made concomitantly, as for example in a single sentence or in a single paragraph in one advertisement. When an appeal is made to a rational motive, the reasons why the consumer should buy the article should be stated plainly. When the appeal is to an instinctive or an emotional motive, on the other hand, it is unnatural to expect the consumer to apply reason in deciding to make the purchase. It follows from this that an appeal to a rational motive and an appeal to an instinctive motive, for example, cannot be developed together effectively because they call for quite different attitudes and mental processes on the part of the consumer. The necessity for observing this distinction applies with equal force in personal salesmanship.

The distinctions between buying motives, such as *distinctiveness, emulation*, and *pride of personal appearance*, or *durability* and *dependability in quality*, to which separate classifications were

allotted in this study, in several instances may appear to be finely drawn. Yet in these nice differentiations between buying motives lies one of the chief requirements for successful salesmanship. The salesperson who understands that *distinctiveness* and *emulation,* for example, are conflicting rather than supplementary motives will undoubtedly obtain a greater volume of sales than one who mixes them indifferently. A sound sales plan must start with the consumer's point of view and one of the chief features of the consumer's point of view to be reckoned with is his precise buying motive.

FINANCIAL INVESTIGATIONS OF INDUSTRIALS

By F. G. COBURN

INDUSTRIAL securities are in general much more speculative than railroad or public utility securities, because industrials are subject to all the hazards of competitive business, whereas railroads and public utilities are regulated monopolies.

What should an investor know before buying an industrial security or participating in the refinancing or reorganizing of an industrial?

It is equally pertinent to inquire as to what information a bank or banker now ordinarily has concerning an industrial upon which to base a decision as to extension of a line of credit or the purchase of an issue, because from a critical study of the answer to this latter question one may derive helpful suggestions as to the information that should be available.

The most common information offered is the balance sheet and the income and profit and loss statement. In addition to these there may be also a history of the industrial, and sundry facts respecting its corporate relationships and the connections of the executive personnel; also the information supplied by the credit agencies, and possibly a list of sales orders on hand at the time, perhaps also some information bearing on a few specific problems facing the management, usually those which make the loan necessary.

I

The balance sheet is not always so simple to interpret correctly as it may seem, because it often carries many items which cannot safely be taken at face value. Take, for example, inventories, the basis of valuation of which is seldom completely disclosed. The stock phrase, "Priced at cost or market, whichever is lower," often covers the pricing of raw materials satisfactorily; but there is almost always a question as to how the costs of work-in-process and of finished goods were determined. In inventories of today, there may be items priced at labor and material costs of 1920, and not fully written down. Inflation may exist from overhead put into costs at rates prevailing in dull seasons when the plant was operating at a low percentage of its total capacity. Moreover, the balance sheet fails to disclose how much, if any, of the material in inventory is obsolete, or shopworn, or otherwise not applicable to current sales, or too highly priced. It is but seldom that the balance sheet is accompanied by an itemized list of the receivables properly aged and showing how the reserve for bad debts was constructed.

These are examples of the problems that one meets in examining the adequacy of working capital and into the ratios of current assets to current liabilities before and after the loan has been made.

The balance sheet may also show, on the assets side, items of investments in, or advances to, subsidiary and affiliated corporations; and it is impossible to tell by inspection whether the advances are collectible, or whether the investment

items belong on that side or on the liabilities side.

As a rule, the balance sheet does not disclose the basis of valuation of the fixed assets. It never shows the suitability or adaptability of the plants, or their condition with reference to maintenance and betterment, or how much of the fixed assets is or will be needed in the business.

Income and profit and loss statements, especially those including sales and earnings during war years, are not often clear as to the effect of war business on the volume of sales and on the profit margin. Frequently they fail to show whether inventory adjustment has been included, or if so, whether the inventory adjustment was sufficient.

The cost of sales is subject to the same kind of questions that arise in considering the valuation of work-in-process and finished goods in inventory, previously referred to; and, in addition, is subject to inquiry as to whether depreciation has been included and, if so, on what basis it was calculated. Neither is it always clear how much has been charged off for bad debts, whether the charge-off was sufficient and whether the company is observing a careful credit policy.

Common use is made of the ratio of current assets to current liabilities, and the rule-of-thumb is that this ratio is satisfactory if not less than two to one, although reflection will show that, if the two-to-one ratio is satisfactory when business is dull and prices are low, it is not necessarily good enough when business is good and prices are high. For example, just after a period of prosperity and at the beginning of a slump, it is clear that there is a strong likelihood that current assets will shrink, particularly inventories and possibly receivables; the current liabilities will not shrink except as retired dollar for dollar; and hence a two-to-one ratio at the beginning of the slump might well result in a smaller ratio at the end of the slump.

Other ratios in common use are net quick assets to funded debt and fixed assets to funded debt. But there are other ratios not commonly used which are of paramount value as, for example, the ratio of sales to net current assets, of sales to net worth, and of net worth to net current assets. Moreover, useful as a set of ratios figured from one balance sheet and one income statement may be, an experienced examiner will derive a much greater fund of useful information from a comparative statement of ratios because the comparative statement shows trends and reflects the policies of the management.

The list of unfilled orders on hand is useful, but to a limited extent only. A great deal of the overextension of credit to industrials in 1920 was due to the fact that their books contained many orders placed in duplicate in the attempt to insure delivery of amounts actually required; many of these duplicates were promptly canceled when the business depression commenced.

Even assuming that every question affecting the balance sheet and income statement is satisfactorily answered, it is still a question as to whether the working capital will be adequate after the loan is made. The answer to that question can, as a rule, be arrived at only after a thorough study involving sales programs, collection experience, budgets, and many other significant data.

The data usually presented to the bank or banker give little, if any, information indicating whether the company's executives are in possession of full knowledge of costs of manufacture

and whether they use that information and, if so, how.

A comparative balance sheet and a comparative income and profit and loss statement are useful if all the valuations are proper and on a like basis, because they provide historical information as to trends. These, however, are not completely to be relied upon without further information concerning the industry, the company's position therein, the position of the industry in the business cycle, and the company's commitments, personnel, organization, policies, and methods. The statement that history is all "bunk" is applicable to the past record of an industrial of which full information is lacking concerning the company's position and management.

Of course, if the applicant for the loan is known to be honest, and if the information furnished indicates that there is an ample margin of safety; and, further, if the loan is for a short time, so that there is a fair prospect of its payment before conditions can change substantially, it may be that the loan can safely be made on information that is incomplete or subject to attack along the lines above indicated. However, if the applicant is badly in need of financial assistance and especially if the loan is to be made for a period of years, it is usually unsafe to make it without a full study of the character outlined.

II

For such purposes, audited figures are, of course, essential, and much information in addition to that which is commonly contained in a report of audit should be furnished in order to disclose clearly the record of the company's financial management, the relative profitableness of its various products (if there be more than one), the value of the data used for estimates of cost of production, for the construction of expense budgets, and for other similar purposes. Not infrequently it is necessary to employ experts in the technique of the engineering, or manufacturing, or both, of the company's product in connection with the market investigation so as to have information from a competent independent source as to the product itself, as well as to the company's record of progress in the art of manufacture of that product, in order to determine the real position of the product in competition.

The investigation should include a thorough study of all of the company's products as to market standing. This cannot be done by taking the company's word for it, but only by making inquiry in the field. This phase of the work should be supplemented by an examination into costs and sales records to find out which products are most important, which ones are most profitable, why production is continued on the less profitable items; whether the company has any outstanding products, and if so, what caused them to be outstanding and what the prospects are for the retention of leadership. There should always be an examination to see whether the company is doing research or development work, looking toward the future improvement of products and processes of manufacture.

In considering a long-term loan, the history of the industry of which the applicant is a unit is needed together with a study of the economic influences affecting the industry in the past. Investigation should always be made to determine price and production fluctuations, mortality in the industry, trends as to prices, demand for the product, and the country's productive capacity;

types or qualities of goods; conditions as to apparent financial strength of other units in the industry, the prospects of the industry as to growth and development, the degree of dependence on the tariff, and the history and trend of tariff rates affecting the industry.

Then the company's own position in the industry may be more intelligently estimated in comparison with competing units, and from the viewpoints both of vendors of raw materials to the industry and of its customers. In addition to knowing how large the company is, how old and how well known, it is always desirable to know whether it is a leader or a trailer as compared with its competitors, and why; whether it has as good a chance for success as its competitors, and why. Connected with this question is that of the value of good-will and patents, and the prospects of possible patent litigation.

The foregoing information forms a basis for an examination of the company's business and financial policies in the past and in the present; its financial structure, its credit policy, the adequacy of its working capital before financing, and how the company got into such a position as to require financing. This phase of the examination involves a study as to policies concerning quality of product, selling prices, attitude toward the public, competitors and customers, the pricing of inventories, reserves for depreciation, depletion, bad debts, inventory losses, and contingencies; dividend payments, and likewise as to policies with respect to business expansion and plant extension. Following this study of past and present, a view may be taken of the principal aims of the company for the future, and of the principal attributes of the policies selected for the attaining of those aims, including, of course, an examination of the purposes to which the proceeds of the loan are to be applied.

This study of general business and financial status and policies leads naturally into the study of sales policies; indeed it is sometimes difficult to tell whether to discuss some policies under the former heading or the latter, because sales policies are so closely allied to general business policies.

It is necessary to know whether distribution is national or local, whether through owned branches or through jobbers or distributers, or direct to dealers, or by a combination of two or more of these methods, and whether the cost of distribution is reasonable. This always involves a study as to whether the policy in effect is a good one and the best policy for the business.

This enables the examiner to make an intelligent study of advertising policies, because they should be closely linked to the general business and selling policies.

Then, it is necessary to find out whether or not the company makes a thoroughgoing analysis of its market; and, if not, the examiner must make a sufficient analysis to enable him to draw a conclusion as to the company's prospects. Further, it is necessary to know whether the company prepares selling quotas for its sales force and, if so, on what basis they are worked out, what sales promotion work is done in connection with the advertising, and to what extent salesmen are held to their quotas.

And after a critical study of the company's selling policies and methods, the actual worth thereof may be tested, both by comparison with the policies and methods of other companies, and by study of the company's own financial records in comparison with those of other companies—such records, for example, as a comparative study of the

ratio of net sales to net worth, of net sales to working capital, of net sales to fixed assets, and to inventory.

III

"By their deeds ye shall know them." A study of a company's policies and performance develops a mass of information concerning the personnel, which, however, must be supplemented by an analysis of the qualifications and records of accomplishment and standing of its members. A study should also be made of the form of organization, which should be suited to the company's business, its policies, and the characteristics of the responsible officers and executives.

More and more it is becoming necessary to examine into the labor situation; the supply of labor and the quality available, living conditions and cost of living, the history of existing labor difficulties, whether the business operates under the open shop or closed shop plan, the method of payment for labor, the average earnings of the labor in comparison with past records and with the average earnings of similar labor in the vicinity, and the relations between the management and the working force.

Thus far, in these notes, practically nothing has been said concerning physical values of plants and inventories. The type and adaptability of the plants and their location, with reference to sources of supply of raw materials and to markets, are of primary importance to some industrials, but in many cases these conditions are secondary to good policies and their proper execution.

However, there should always be made a thorough examination of the plants as to replacement cost and their "going-concern" value considering depreciation therein, also their adaptability to the purposes to which they are applied, and, as well, their adaptability to other purposes if the company should fail; the location of the plants as compared to the locations of competitors' plants; the arrangement of departments, and of the equipment within the departments, the care shown in the maintenance of the property and in the development of new machinery and equipment, the fire hazard, transportation facilities and availability of space for expansion. It seems almost unnecessary to add that a study should be made to see that the useful life of the property properly maintained is substantially greater than the life of the proposed issue, were it not that that detail has been overlooked many times.

An investigation into the inventories should be made, to find out when the last physical inventory was made, how it was priced, and in what respects and to what extent its valuation should be adjusted on account of unsuitable or damaged or deteriorated raw materials, and obsolete or slow-moving finished goods; and as to the basis of labor, material, and overhead costs used in pricing it.

With the above-mentioned information in hand, and with reports of audits made in the past, together with special accountants' studies and reports bringing out all operating information, the record of earnings of the company may be studied, and the earning capacity may be estimated. After all, an industrial security is but the evidence of ownership of a part of that industrial's earning power, and this is based upon all the considerations referred to in the foregoing notes. It is on an estimate of that earning power, based upon the data produced by a painstaking investigation, that a decision as to the purchase of

securities or the extension of credit should be made, rather than upon considerations of values of fixed assets or such common criteria as the ratio of current assets to current liabilities, or to the total principal amount of the issue in question.

Finally, if it be concluded that the financing should be done, it is most necessary to make every effort to insure that the restrictions of the financing contract, or the indenture, will not hamper the management of the industrial in after years under changed conditions. It is not uncommon, for example, to find that a business is seriously embarrassed by a requirement for a specified minimum ratio of current assets to current liabilities, or of net quick assets to bonds; and sometimes a bond sinking fund requirement will operate to reduce working capital in times of increasing business. In other words, it is quite possible that a restriction which was set up to protect the interests of the lenders may actually defeat that very object, and it is of great importance that the investigator should cover this aspect of the financing, because it has so much to do with the future of the business.

PROBLEMS IN THE DEVELOPMENT OF A SUPER-POWER SYSTEM

By C. O. RUGGLES

ONLY those who have had occasion to interest themselves in the development of the light and power industry have an appreciation of what has happened within that business during the last 20 years. Nor is it generally understood how this development has affected other industries, and in turn, how the light and power business has been affected by its more intimate relationship with industry. Finally, there is lack of appreciation of the significance of the changes that have taken place in the light and power business within the last 20 years in so far as these changes affect our theories of rates, our idea of a fair rate of return, and our program of regulation of this important utility.

Attention will be given in this discussion, first, to some of the important developments in the light and power business; second, to some of the advantages of these changes and to the reasons why such changes have occurred; and finally, to the effect upon theories involved in the public regulation of the business.[1]

When electricity first came into use in the early eighties, it had to compete with gas, first for purposes of illumination and later for use in the industries. According to the latest census statistics[2] covering the whole United States, the income from the sale of electric current increased during a decade more than three times as fast as did the sale of gas at periods for which statistics are most comparable.

At first, central station managers did not have adequate appreciation of the importance of the power phase of their business. Most of their attention was given to the lighting business, and the national association through which they exchanged ideas was named the "National Electric Light Association." Even in the late eighties only a small minority of the members of this association had any real vision of the possibilities of the development of power, and at this time the association had no committee on power.

The development of high efficiency lamps helped to force many central station managers to give attention to the sale of power. Installation of high efficiency lamps within the decade following 1900 meant that many stations, which had depended almost wholly upon the sale of light, found themselves

[1] The Federal Census of electrical industries, which has been taken at five-year intervals since 1902, covers most of the period with which this discussion is especially concerned. From these census returns certain facts may be taken to show tendencies in the development of this utility for the past two decades. Some facts were secured concerning central electric stations in the census of 1890, but this was not comprehensive. It covered only the State of New York and the City of St. Louis. In 1898 the United States Commissioner of Labor attempted to secure information on the electrical industry, but the returns covered but 632 out of a total of 2,572 commercial stations and but 320 out of 640 municipal plants. See *Federal Census of Central Electric Light and Power Stations, 1917,* and *Fourteenth Annual Report of United States Commissioner of Labor.*

[2] This is the census of "Central Electric Light and Power Stations" for 1917 and is the source used throughout this article, unless otherwise indicated. Unfortunately, the 1922 census of electrical industry is not yet available.

with a rapidly decreasing revenue. It is obvious that certain fixed expenses and a decreased kilowatt-hour consumption would not be a desirable combination. The reorganization, which high efficiency lamps forced in many central electric stations, was comparable to the changes which were brought about in the gas business when electricity was introduced. The gas companies, which had given most of their attention to lighting, discovered that they should turn attention to the sale of gas for industrial purposes.

Important Developments in the Light and Power Industry in Recent Years

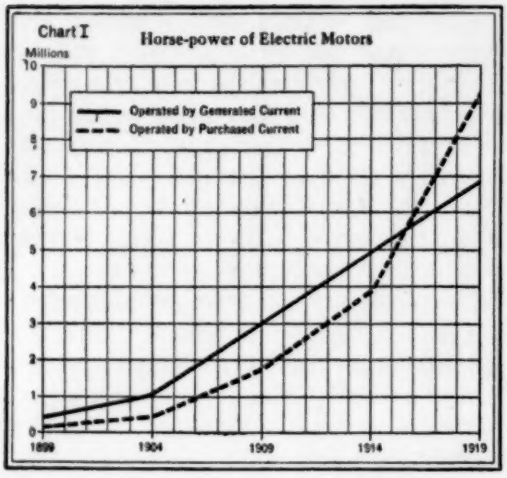
The changes which have taken place in the central electric station industry within the past 10 or 15 years are well reflected (1) in the large increase in the output of power as compared with the number of stations; (2) in the character of generating equipment; (3) in the number of communities served, compared with the number of stations; (4) in the number of companies located in one state and doing business in adjacent states; (5) in the increase in the number of stations which have no generating equipment or which use it only for standby purposes; and (6) in the percentage of total business which is confined to electric lighting.[3]

The shift in the light and power business to the use of alternating current helped to centralize the light and power business, because this shift made possible efficient transmission of electrical energy over long distances and facilitated the transformation and distribution at different voltages, which in turn adapted this source of power to a very wide variety of uses. Such a development in the electrical industry naturally caused many small generating plants either to scrap their generating equipment or to use it only for standby purposes.[4]

In the New England, Middle Atlantic, East North Central and Pacific divisions, there were very notable decreases in the number of plants which generated all their power in the decade 1907-1917. The income of stations shows a much greater increase for the large central stations than for the smaller ones. Further, it is a matter of common knowledge that there has been an enormous expansion in the area and in the number of cities which central stations serve at the present time. Space would not permit of an adequate statement of what this expansion has been even in the single state of Illinois. According to the census returns there were, even in 1917, 60 public utility companies with their generating equipment in one state and distributing a portion of their energy in one or more other states.

[3] The latest census return available for the electrical industries, that of 1917, shows that while the number of central stations aside from municipal plants increased during the decade ending at that time but 22%, the total gross income increased over 200%; that the horse-power of prime movers increased nearly 220%; that kilowatt capacity of the stations increased during the same decade 236%; and that the kilowatt-hours generated increased more than 337%. The number of stationary motors served increased during the same period over 210% and their horse-power capacity more than 443%.

[4] While the total number of stations having generating equipment increased but 16.8% during the decade 1907 to 1917, the number having no generating equipment increased in the same period over 472%. During the five-year period ending in 1917, there was an actual decrease of 2.5% in the number of commercial stations generating all their current, while the number of commercial stations purchasing all of their current for the same period increased 99.8%. For example, plants with a capacity under 200 kilowatts showed an increase in gross income of but 6.2%, while those with a capacity of 5,000 kilowatts and over showed an increase of over 330%. The facts also show that 4,224 plants served 11,349 communities, or an average of almost three places to each central station.



That the next census of the light and power business will show an increase in the number of such plants is obvious to those who have followed the events in this field during the past five years.

As would be expected, the utilization of water power which has resulted from increasing fuel costs has brought about centralization of hydroelectric plants to a more marked degree than has been true of other stations. This has been especially true in the northeastern part of the United States, along the Canadian border, in the Rocky Mountain region, and along the Pacific Coast.[5]

That this enormous expansion of the business of central electric stations never could have occurred, if their activity had been confined to the limits which most central station managers had set for their business in its early years, is obvious when it is seen what proportion of their output was used for electric lighting only. The last census shows that of the total electrical energy sold by commercial stations (not including municipal plants) but 18% was sold for light, a fair portion of which was for small motors and appliances; that over 51% was sold for power, and over 30% was sold "to other companies."

If we now look at conditions outside the central electric station business, it is possible to see where much of the increased output of electrical energy is being used. Examination of Table I will show the extent to which central electric stations are furnishing the power for manufacturing in this country.[6]

Examination of United States Census returns on manufactures indicates that

[5] The latest returns show that while the horse-power of prime movers in the hydroelectric plants increased by 84.7% and the total generator capacity increased 99.8%, the corresponding increase of all stations for the same period was but 71.8% and 74.1% respectively. Likewise the number of kilowatt-hours generated by hydroelectric plants increased during the same period more than 138%, while for all stations it was little less than 120%. With but 5% of the number of all generating plants, the hydroelectric stations served 22% of the cities and towns and supplied 45.6% of the horse-power which was generated by all stations. The character of the business done by the hydroelectric plants has indicated that only 23.5% of the current which they sold was used for lighting purposes. That there is likely to be a substantial increase in the amount of electrical energy generated by hydroelectric stations in the near future is evidenced by the applications which have been made to the Federal Power Commission since its creation in 1920 for permission to develop water power. See address of O. C. Merrill, executive secretary, Federal Power Commission, before the National Electric Light Association, June 8, 1923.

[6] It will be seen that in the 20-year period, 1899-1919, the horse-power of engines and motors *owned* by manufacturing establishments decreased from 96.8% to 68.1% of the total of all motors used in such industries; that the use of rented motors increased from 3.2% to 31.9% of the total; further examination of the table shows that practically all of the 31.9% of rented motors were electric motors; that the increased horse-power of rented motors was being run to an increasing extent by central electric stations is seen from examination of the statistics on horse-power run by current generated by the manufacturing establishments themselves and run by rented power. The former shows a decrease from 63% of the total in 1899 to 42.6% in 1919, while the latter shows an increase during the same period from 37% to 57.4% of the total. Chart I, based on Table I, shows graphically this tendency of manufacturing establishments to purchase their current from central electric stations rather than generate it for themselves.

TABLE I. OWNERSHIP AND OPERATION OF ENGINES, OF MOTORS IN MANUFACTURING INDUSTRIES*

	Number of Engines, or Motors					Horse-Power of Engines, or Motors					Per Cent Distribution of Horse-Power of Engines, or Motors				
	1899	1904	1909	1914	1919	1899	1904	1909	1914	1919	1899	1904	1909	1914	1919
Owned	168,143	169,774	209,163	192,934	170,068	9,778,418	12,854,805	16,802,706	18,439,941	20,124,961	96.8	95.2	90.0	82.1	68.1
Rented	†	61,589	199,309	451,002	996,000	319,475	632,902	1,873,670	4,020,931	9,442,156	3.2	4.7	10.0	17.9	31.9
Electric						182,562	441,582	1,749,031	3,901,048	9,347,556	1.8	3.3	9.4	17.4	31.6
Other						135,913	191,313	123,639	119,883	94,600	1.4	1.4	0.7	0.6	0.3
Electric Motors Operated by current generated by the establishment	16,891	73,119	189,545	321,360	495,229	310,374	1,150,886	3,068,109	4,938,722	6,949,827	63.0	72.3	63.7	55.9	42.6
Current rented	†	†	199,309	451,002	996,000	182,562	441,589	1,749,031	3,901,048	9,347,556	37.0	27.7	36.3	44.1	57.4

* This table is compiled from the United States Census returns on Manufactures, 1899 to 1919.
† Not reported in census returns.

since 1909, steam engines have been decreasing as a factor in the manufacturing business in the United States. In 1909 such power constituted 76.2% of the horse-power used in the manufacturing industries; by 1919 this had decreased to 57.8%.[7]

Likewise in mining there has been a marked increase in the amount of electric current purchased, while in most instances there has been a relative decrease in the amount generated by the various mining enterprises themselves.[8] It would probably be expected that such a change would occur in most mining enterprises other than that of coal mining. Taking the metal industries as a whole, they are now purchasing almost as much electrical energy as they are generating.

In the stone-quarrying industries, including limestone, granite, sandstone, basalt, slate, and marble, there was an increase of horse-power of motors operated by electricity generated by the industries themselves of 10.4% in the decade ending in 1919, while the corresponding increase for motors operated by purchased electricity was 416.8%.[9] In other words, the horse-power of motors

[7] These figures are not quite accurate as they include steam turbines in 1909. See *Statistical Abstract of the United States, 1921*, page 221.

[8] Examination of the facts shows that in the iron ore mining industry, while there was a decrease of 20.1% in the horse-power of prime movers used in this industry in the 10 years ending in 1919, there was during the same period an increase of more than 2,000% in the horse-power of electric motors operated by purchased current. The most marked change occurred in the Lake Superior region, where the horse-power of electric motors in 1909 amounted to less than one-tenth of 1%, whereas in 1919 it amounted to 26.9%. The extent of electrification in the industry as a whole is indicated by the ratio of the horse-power of electric motors of all classes (including those operated by current generated by the industry and by purchased current), to the horse-power of prime movers. This ratio in 1919 was practically 60%. For producing mines in the Northeastern region, the horse-power of all electric motors was about four-fifths that of prime movers, while the corresponding ratio in the Lake Superior region and in the Southeastern region was about four-fifths and about one-third respectively. In most of the metal mining industries the increase in the horse-power of motors operated by purchased electricity was greater than the increase in the horse-power of motors operated by electricity generated within the mining industries. The most marked increase occurred in the lead and zinc mining industry, in which the increase in the horse-power of motors operated by electrical energy generated within the industry increased but 89.9%, while the corresponding increase for motors operated by purchased current was 3,307.7%. This information is found in the *Fourteenth Census of the United States*, Volume XI, "Mines and Quarries."

[9] The most marked case was that of the marble

TABLE II. POWER USED, PRODUCING ENTERPRISES, 1919

INDUSTRY	AGGREGATE HORSE-POWER	PRIME MOVERS									EQUIPMENT OPERATED BY PURCHASED POWER			ELECTRIC MOTORS RUN BY CURRENT GENERATED BY THE ENTERPRISE REPORTING	
		TOTAL HORSE-POWER	STEAM ENGINES (NOT TURBINES)		STEAM TURBINES		INTERNAL-COMBUSTION ENGINES		WATER WHEELS AND TURBINES		ELECTRIC MOTORS		OTHER		
			NUMBER	HORSE-POWER	NUMBER	HORSE-POWER	NUMBER	HORSE-POWER	NUMBER	HORSE-POWER	NUMBER	HORSE-POWER	HORSE-POWER	NUMBER	HORSE-POWER
All industries	6,723,786	5,111,531	46,433	3,238,288	553	473,985	56,988	1,361,146	287	38,112	40,500	1,603,390	8,865	32,980	1,258,795
Coal:															
Anthracite	899,783	782,090	5,298	730,141	45	50,665	73	1,284	.....	.....	1,881	117,693	.....	3,801	183,723
Bituminous	2,155,412	1,383,934	9,177	1,166,862	313	195,779	1,246	21,219	9	74	21,186	771,131	347	21,044	707,341
Petroleum and natural gas	1,821,342	1,770,181	23,412	532,734	.....	.....	53,699	1,237,407	2	40	1,841	44,638	6,523	1,329	28,164
Iron ore	370,869	273,477	2,333	231,184	25	29,521	45	5,397	22	8,375	1,341	97,382	10	1,112	67,595
Copper	523,591	386,458	842	245,398	79	123,223	129	16,327	10	1,510	3,647	135,968	1,165	3,252	161,024
Lead and zinc	229,541	117,527	411	42,821	21	35,420	433	35,415	30	3,871	2,389	111,874	140	625	22,884
Gold and silver, lode mines	149,680	50,437	182	20,133	4	4,750	370	11,149	135	14,405	2,523	98,663	580	494	18,892
Limestone	213,717	126,387	1,776	109,778	17	10,701	252	5,043	9	865	2,046	87,330	.....	267	11,421
Granite	55,674	34,711	744	30,231	3	2,360	84	1,343	4	777	450	20,903	60	34	1,520
Sulphur	15,291	15,291	544	11,581	23	3,320	13	390	.....	.....	.....	.....	.....	50	1,284
Sandstone	33,869	21,197	340	19,081	.....	.....	71	2,116	.....	.....	386	12,672	.....	155	4,696
Phosphate rock	49,639	46,976	100	17,140	17	17,750	44	12,085	.....	.....	38	2,663	.....	320	33,107
Clay	21,240	6,932	263	15,653	1	100	105	1,179	.....	.....	181	4,271	40	66	1,815
Basalt	37,300	22,844	259	21,099	3	1,225	30	520	.....	.....	255	14,463	.....	11	1,049
Gold, placer mines	35,632	3,406	2	40	.....	.....	16	719	25	2,647	624	32,226	.....	22	601
Gypsum	15,032	7,038	47	6,132	.....	.....	9	572	3	334	290	7,994	.....	103	1,447
Slate	20,613	8,778	193	8,669	.....	.....	1	8	2	101	426	11,835	.....	4	44
Marble	15,628	6,021	85	5,619	.....	.....	2	15	3	387	408	9,607	.....	19	480

in the stone-quarrying industries operated by purchased electricity was in 1919 more than eight times as much as the horse-power of motors operated by electricity which they generated. Even in coal mining it has been found that central electric stations can compete with the coal mines in the generation of electricity to be used at the mine.[10]

If all mining industries of every description in the United States be taken together, we had already reached the point in 1919 when the horse-power of motors operated by purchased electricity equaled over 56% of the total. Details of each industry are given in Table II.

Economies Attained through Large-Scale Generation and Transmission of Electricity

The explanation of this unusual development of the central electric station industry is to be found in the advantages which have come through the centralization of the generation of electrical energy and its distribution over several hundred miles to rural areas, to manufacturing districts, to mining regions, and to cities and towns of every description. Those advantages may be grouped under two divisions—first, those affecting the cost of electrical energy, and second, those affecting the character of the service.

Among the factors which have influenced the cost of electrical energy may be mentioned the economies which have been brought about by the improvement in load factor, thus affecting the necessary capital outlay, and in the reduction of certain operating costs. Concretely, the central stations have not built transmission lines for the mines alone. Many other important consumers are found along the way to the mine. Moreover, in some instances, central stations are being built at the mouth of the mine itself where it is also possible to secure sufficient water for condensing purposes. The diversity in demand which a big central station is able to take advantage of because not all of its consumers use current at the same time gives it an advantage over the mine which usually generates current merely for its own use. Since the fixed costs in the central station business are very substantial, the number of hours per day of use of maximum capacity of the plant is a real factor in keeping down the cost of generating electricity. This fundamental factor goes far in explaining why mines find it economical to purchase current from a central station rather than to generate it for themselves. In the last five years for which we have census returns, there was an increase of 25.4% in the hours during which commercial central stations used

Footnote 9 continued from page 163: industry, where the corresponding percentages were a decrease of 94% and an increase of 1,050.5%. Taking these industries as a whole, motors operated by electricity which they generated in 1919 had a horse-power of 19,210, while the corresponding figure for motors operated by purchased current was 156,870.

[10] It was at one time thought that central electric stations could not compete with coal mines in the generation of electricity to be used in the mine. It was believed that since the mine had the coal at hand, it would not be possible for a central station to pay transportation on the coal, build transmission lines to carry the electric current back into the mine, and be able to compete with the mine in the generation of electrical energy. But the unexpected has happened. The census returns show that in 1919 we had almost reached the point where the horse-power of motors operated by purchased electricity equaled that of motors run by current generated by the coal mines themselves, the figures being 888,824 and 893,064 horse-power respectively. If the bituminous coal mining industry be considered by itself, the horse-power of motors operated by purchased electricity exceeded that of motors operated by electricity generated by the mines, the horse-power operated by purchased current being over 52%.

their plant to maximum capacity. Of course, this improvement in load factor is reflected in the cost of electrical energy. To repeat, as the size of a central electric station increases, and it takes on a sufficiently large number of consumers to profit by the diversity in their demand, a given investment is used more intensively, and consequently, there is found a constant decrease in the investment necessary for each kilowatt-hour sold.[11]

Improvement in Service through Centralization

In many localities in which there was formerly operating an independent electric light plant, there was only a "dusk to dawn" service; indeed in many communities such plants operated on a still more restricted schedule. Often this service was very unsatisfactory. Even a very small plant that might be unable to generate electricity for less than 15 cents per kilowatt-hour might have an intermittent service that was almost worthless.

Obviously communities receiving such service were willing to listen to the proposal to scrap the generating equipment of the local commercial or municipal plant, and tie the community into a high-power transmission line which would give a highly satisfactory service over 24 hours, thus making possible the use of electrical current for household appliances and for the industries in the community.

The process of tying the various communities together has followed the development already described. This tying of various plants together into a sort of a "federal reserve power system" means that, if a plant in one community breaks down, it is possible to serve the consumers from a plant situated in another locality. This in turn means such a degree of certainty in the furnishing of electrical energy that the tendency in manufacturing establishments, and in mining, previously pointed out, to scrap their own generating equipment and depend upon the central station for current will be seen to be even more marked when the next census returns of manufacturing and of mining are available. It is common knowledge that many manufacturing establishments and some mining enterprises were forced to cease generating their own electricity during the war, either because of high prices for coal, or in some instances, because they could not secure coal at any price. The public utilities could take advantage of priority orders in shipments in securing coal, and industries indirectly took advantage of such orders through the purchase of power from the central electric station. The fact, too, that electricity was not increasing in price at the rate which other commodities were advancing, especially coal, doubtless caused many manufacturing establishments to purchase power although they may have been able to generate it for themselves.[12] It is probable that many industries, which purchased power for the first time during the war, will continue to purchase it rather than to generate it for themselves.

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[11] There are, of course, limits to the economies which can be realized from increasing the size of a central station. Further reference is made to this subject later in this article.

[12] The United States Bureau of Labor (*Monthly Bulletin*, May, 1923) has collected statistics on the household rates of electricity in 32 selected cities, covering the period from 1913 to 1923. It will be seen from an examination of the facts that rates for electricity advanced but very little during the years of the war, while the price of coal, which is also given, had advanced at an enormous rate.

The Need for a "Federal Reserve Power System"

The foregoing analysis of the light and power business and its relationship to industry shows clearly that there is a very definite tendency in central station development for large plants to supplant the small ones. This does not mean, however, that there are no limits to the increased size of central stations. Indeed the United States census returns indicate that there are limits beyond which there are no further economies to be gained. The so-called "representative firm," concerning which the English economist, Marshall, has had much to say, appeared, according to the last census returns, to have been found in the light and power industry at about or beyond the 200,000,000 kilowatt-hour output for steam plants. While improvements within the electrical industry will probably show a somewhat higher limit in the next census returns, it is nevertheless evident that there is a limit beyond which a central plant cannot economically extend its business. This in turn means that it is highly important to have the central stations of the various communities inter-connected, thus forming a sort of "federal reserve power system" so that each may serve as a standby plant for the other. Such a plan, carried out on a comprehensive scale, would eliminate an enormous investment as insurance against a possible breakdown in service. Indeed this inter-connection should not be thought of as serving emergency purposes only. It can and should serve in the power industry as our federal reserve banking system serves financial needs by a shifting of electrical energy to the localities where, at the time, there is the most pressing demand for it. Such a scheme of interconnected central stations would make possible the utilization of much hydroelectric power which is not available for every month in the year. With a complete system of inter-connection there should be a constant inter-change of power between centralized systems, thus necessitating a settlement of balances only. Just as the diversity of demand among consumers of one central electric station enables a given investment to serve all consumers more economically than they can serve themselves, just so can the tying in of generating stations into inter-connected systems extending over thousands of square miles enable central stations to inter-change power to their advantage and to that of the communities concerned.

Effect of Central Electric Station Development upon Rate Theories

While distinct advantages both in the reduced cost of generating electrical energy and in the improved character of the service have been realized through the centralization of the light and power business and through the inter-connection of these centralized systems, there are, on the other hand, some difficult problems presented for solution as a result of the developments which have been discussed. Space limits the consideration which may be given to these problems. Attention will, therefore, be confined to the effect on rate making, on the so-called fair return, and on the character of the regulation itself.

Before electric central stations had spread out beyond the limits of the cities, in which they were located, rates were made upon a so-called municipal basis. Now, however, with one power station serving a large number of different communities, the question has arisen as to what constitutes a proper basis upon which to fix rates. Places which are

located near the generating plants of a central station system sometimes argue that they should have a very much lower rate than is given to places, say, 200 miles away. Obviously the question of rate making for light and power is not as simple as it formerly was. The Interstate Commerce Commission, in fixing railroad rates, while it has followed no hard or fast rule, has ordinarily held that a place should not be robbed of its geographical advantages. This might argue for lower rates for communities situated near a hydro-electric development than would be given to localities located on the circumference of the circle served by such a plant. But the development within the electrical industry itself may in turn vitally affect the manner in which a group rate theory ought to be applied. Suppose at one stage of central station development a plant might be able to serve 10 communities. Suppose that 10 years later because of advances which had been made in the generation and transmission of electrical energy, the same power station would have been enlarged and would be at the later date serving 100 communities. What, under such circumstances, constitutes an equitable rate structure for all the places concerned? Do the so-called natural advantages, on which the Interstate Commerce Commission has placed some reliance, change in meaning and hence in application with fundamental changes in the generation and transmission of electricity? Can the original 10 cities fairly claim that they should be given a rate on the basis of transmission costs to them? Or should "natural geographical advantages" be interpreted to mean that "representative" central station, to use Marshall's term, through which the maximum of external and internal economies can be realized? If this last question is to be answered in the affirmative, then it will be necessary to modify some of our early rate theories. If the municipal basis has almost completely disappeared in the generation and transmission of electricity, should not the municipal basis of rate making also go into the limbo? The Wisconsin Supreme Court has recently held that under Wisconsin law it is necessary for the Wisconsin Railroad Commission to make rates for electricity in that state on a municipal basis; that it is neither the business of the Commission nor the courts to make such rates on a group or loop basis; that only the legislature can determine whether such a basis for rates shall be adopted.[13]

It ought to be clear that a central electric station serving 100 communities might be able to generate electricity at a very much lower cost than if it served but 10 communities. Indeed the very reason why it might be able to generate and distribute current at a very low cost would be because the serving of the other 90 communities would enable it to realize a maximum of economies. To argue then that the rates to nearby cities should be based upon the distribution or transmission costs is to ignore the very important fact that the cost of generating the current would doubtless be very much higher were it not for the fact that the central station was being operated on a very large scale due in turn to the presence of the other cities within the limits of the area which the company would find it advantageous to serve. For example, if there had not been a remarkable development of the central station business in and around Chicago, would there be today the gen-

[13] *City of Eau Claire et al v. Railroad Commission et al,* Public Utilities Reports, 1922 D, 666. The legislature has taken no action on the subject.

eration of electricity on such an enormous scale, say, at Blue Island? Yet consumers at Blue Island have contended that they should have very low rates because they are next door, as it were, to the generating plant, apparently forgetting that such a plant with its very low cost per kilowatt-hour never would have been in existence had it not been for many thousands of consumers throughout Chicago and its environs who were being served by the same generating station. Similar situations are not infrequently encountered by regulating bodies in the adjustment of railroad freight rates.

The foregoing argument does not mean that there should be no differences in the rates of different localities served by the same central station. But it does mean that in grouping cities for rate-making purposes it must be done on a logical basis which will take into consideration all of the external and internal economies which result from the very fact that the larger group of communities is being served by the same central station. This will probably mean that the plan of dividing the individual consumers of a central station into classes for rate-making purposes must now be followed out in a logical and equitable "classification" of communities. Obviously each group of localities would present its own peculiarities, and rate structures would need to be worked out on the merits involved.[14] One thing, however, seems certain, that since the basis for the generation and transmission of electrical energy has passed far and beyond the municipal basis, the rate structure must now conform to the fundamental economics of the new situation.

[14] For an interesting case see *Dallas Power and Light Co. v. Carrington*, Texas Court of Appeals, 245 S. W. 1046.

Central Power Station Development and Theory of Fair Return

As to the fair return to which a light and power company may be entitled, the changes of the last 20 years present some vital considerations. Statistics for the generation of electricity by years and by months, for the United States as a whole, indicate that since the light and power companies are furnishing electrical energy to most important industries, they are much affected by business depression.[15] Obviously so long as central stations furnished energy mainly for lighting purposes, they would not be so seriously affected by general business conditions. In other words, a distinct element of risk has been introduced into the light and power business by taking on as customers the very large industries which may curtail the current which they consume in times of depression, or in some cases, even shut it off altogether. This, in turn, means that the period of time which may be assumed as the proper one on which to determine whether a light and power company is receiving a fair return will need to be considered in terms of the business cycle. Some of our states have heretofore made the calendar year as the proper basis, or if the law has not required it, some of our commissions have assumed this period as the proper one. This may have been satisfactory where there was little difference in the character and volume of a company's business from year to year. To repeat, the character of the business of the utility which sold current mainly for lighting purposes was such that its revenue was little affected by business depression. Now, on the other hand, with the shift of in-

[15] See *Survey of Current Business*, published by U. S. Department of Commerce, which gives facts collected by U. S. Geological Survey.

dustry away from the generation of its own power, the central station must be ready to serve very large industries during times of business boom, and yet be prepared to weather periods of industrial depression. That is to say, the central station business must now adjust itself to two extremes. It must make heavy capital investment to be ready to serve the peak load which a brisk period of industrial activity presents. With the slump in business, it must have sufficient funds to carry it over a period of decreased revenue.

In light of the foregoing facts, business men now have a very vital interest, whether they appreciate it or not, in the rate of return which is allowed the light and power utilities. This utility is very rapidly becoming a department, so to speak, of their own business. They are depending on it to an increasing extent to furnish them with "fuel," that is, with power. It is even more than this, for the application of electrical energy as power makes possible certain mechanical processes in production which reduce production costs and in addition relieve industrial management of certain labor problems. Moreover, the use of electrical energy lends itself readily to the substitution of automatic for human control in process production. During periods of marked industrial expansion, there is always a shortage of labor, and to an increasing extent electrical energy will be employed to offset this shortage. The business man, therefore, does not want the public utility to earn more than a fair return, for this, in turn, would probably increase his own cost of production. But the business man ought to be just as much interested in seeing that this utility, which is rapidly becoming, as it were, a "department" of his own business, receives the return to which it is entitled, otherwise it may not have adequate facilities to serve industrial needs. An interesting instance of a lack of appreciation of this fact is seen in a case which came before the Vermont Public Service Commission, in which that body, in considering the feasibility of a coal clause which provided for an adjustment in rates in accordance with the price of coal, held that the granite and manufacturing business in that state had a right to know the electric rates to be in force for a given time as a guide to their judgment in fixing prices.[16] It ought to be clear that these industries would be obliged to accept the risk involved in the market price of coal if they were generating their own power instead of purchasing it. But under the theory of the Vermont Commission, a public utility would be expected to absorb the risk on fuel prices for all industries for which it might be furnishing power. Inasmuch as the earnings of public utilities are limited to a fair return, while those of ordinary business are not, it would appear to be unfair to expect the public utility business to absorb the risk involved in fuel prices for all industries which it was serving.

In view of the fact that the element of risk has been introduced into the light and power industry through its service to other industries it ought to be clear that a very high grade of management will be necessary for this utility in the future. The business man will expect the central station to be ready to furnish him an increased amount of electrical energy if his business demands it. This will demand vision on the part of central station management to build plants sufficiently ahead of needs to be able to meet the

[16] *Jones v. Montpelier and Barre Light and Power Co.*, Public Utilities Reports, 1921, D 145, 150.

increased demands of industry, and yet not overbuild his plant too much.

In view of the new and vital relationship which exists between industries in general and the light and power industry, business men ought to have an interest in stimulating efficiency in the management of this utility and of providing a penalty for inefficiency in its management. When business men used electrical energy principally for lighting their residences and business establishments, this question was not so important as it is at present, when with the use of electrical energy as power it has become an important part of the cost of production. Men are ordinarily much less prudent in their use of what are primarily consumption goods than they are in the use of production goods. In view of their changed relations to the light and power industry, business men ought to insist upon an equitable adjustment of rate schedules with changes in industrial conditions, thus making it possible for the public utility to earn a fair return.

Effect of Central Power Station Development upon Character of Regulation Itself

Finally attention may be turned to the effect which the changes that have been described are likely to have upon the character of regulation itself. Within the past few years, there has been much agitation for municipal regulation of public utilities. This movement has gone so far in a number of states as to demand the repeal of the laws providing for state commissions. The explanation of the movement is not difficult to find. When the state commissions were first established, they were popular, because for some years following their establishment they were making reductions in rates. But when these commissions granted increases in rates during the recent war, there was much agitation in some parts of the country to have these bodies abolished.

In light of the previous analysis and discussion of the changes which have come in the light and power business, it would appear to be clear that the problems of regulation of this utility have gone very much beyond municipal jurisdiction. The issues may now very well involve a hundred municipalities. Indeed this utility has already reached the point where many of the problems of rates, valuation, rate of return, or other vital questions demand interstate regulation if they are to be dealt with in an intelligent and equitable manner. The writer is somewhat familiar with the work of several state commissions. The members of those commissions sometimes comment on the fact that certain light and power utilities doing business both of an intrastate and of an interstate character come to the commission when there is anything on which they feel they can profit by doing so; that, if there is a phase of their business which they do not desire to bring to the attention of the commission, they contend that such matters are interstate in character and that, therefore, they consider that the state commission has no jurisdiction over them. The instances in which they could have excuse for such action are increasing daily.

It would appear that the light and power industry, to say nothing of some of the other utilities, has reached a stage in its economic development where municipal home rule is no longer feasible in its affairs. On the contrary the situation demands strong state commissions. Indeed the light and power business has reached such a stage in its development, that in addition to strong

state commissions there should be either a subdivision of the Interstate Commerce Commission, or an Interstate Public Utilities Commission created for the purpose of regulating interstate utility problems other than railroads. While there are distinct advantages in the large-scale operation which characterizes the light and power business, and while the interests of the public demand even greater inter-connection of one section of the country with another, it is these very developments which carry the problems of regulation well beyond the limits of any one state commission. We thus have the old twilight zone appearing in this utility as it spreads out over several states and hence beyond the jurisdiction of any one of them. Many of the inter-utility relationships which have been established in the light and power industry have been for the purpose of escaping certain state control. If holding companies in this field, for example, are to serve the purposes which they should, there ought to be a jurisdiction wide enough to cover the entire program of their activities.

Conclusion

From the foregoing analysis of the light and power industry, it is clear what the tendency in the development of this business is; moreover, it is probable that this tendency will be even more marked with the passing of time. It will be necessary, therefore, for the public to realize that this important public utility has grown beyond the jurisdiction of municipalities, even in many matters beyond the jurisdiction of any one state. The local intelligence of cities can be drawn upon in a coöperative plan of regulation which it ought to be possible to work out, but such phases of utility affairs as involve control over accounts, rates, valuation, finance, and many other vital matters can be effectively regulated only by the state and in an increasing number of instances only by the Federal Government. The regulation of the light and power business ought to be brought into line with the fundamental economic changes which have occurred in this industry. We are at present having a duplication of public utility facilities in the activities of big holding companies, which are invading each other's territory in the power business without regard to the best interests of the communities served, and we are probably just on the threshold of much duplication in the furnishing of the power for electrification of our railroads. Generally speaking there should be but one central power station in a community. If the railroads go into the power business in connection with the electrification of our terminals, there will be much duplication of very expensive plant. The public must then pay rates to cover two heavy fixed costs, where one charge ought to suffice. We have had enough unfortunate experiences in the United States with duplication of railroads and other public utilities that we ought to have sufficient vision to demand that a power company, attempting to enter a community which is already provided with one, should be required to secure a certificate of convenience and necessity before doing so. This would be desirable so far as railroads entering the power business are concerned, even if they did not attempt to sell power to other consumers. Through the diversity of demand and the improvement in the load factor, a central power station can furnish electrical energy for railroad electrification cheaper than the railroad can make it for itself. Time will show that this is as true for railroads as events

have proved it to be for the manufacturing industry and for mining. For the same reason, there ought not be both a municipal light plant and a commercial power station in the same community. One or the other should do all the business for the community. Some time we shall reach a stage when we shall appreciate the fundamental economic principles on which the light and power industry should be conducted. Up to date we have made the very serious error of reading into this business the economics of ordinary industry, and we do not yet see that we are headed in the wrong direction.

Of course monopoly must be accompanied by adequate regulation. Since the economics of this business demands that it be conducted as a monopoly, the sooner we appreciate this fact the sooner shall we have electric current at a lower cost, and the sooner shall we have a service which will be much more dependable than it otherwise could be.

While facts in Tables I and II show rapid strides in the use of electricity, it is also evident that the central station industry is in the very early stages of its development. The country needs a comprehensive development of central power stations, and these, in turn, should be inter-laced into a federal reserve power system. If power is to play an ever-increasing rôle in industry, such a plan is imperative. But such development can be carried out successfully only under a program of regulation which has a jurisdiction fully as comprehensive as the activities of the utility itself. It is not the technical factors which are at present retarding such a comprehensive development as much as it is political, legal, and economic considerations. Not until the fundamental economics of the business is given preference over arbitrary municipal or state boundaries in determining the character of regulation will there be the development in the light and power industry which is feasible in this country and to which the public is entitled.

THE FINANCING OF ENTERPRISES IN GERMANY UNDER CONDITIONS OF DEPRECIATED CURRENCY

By FRIEDRICH LEITNER

THE enormous increase in legal and other tender as the economic result of the lost war and the provisions of the peace treaty has created new purchasing power daily in the form of credit and has increased commodity prices. So long as the costs of this increase of credit money—namely, bank interest—remained less than the purchasing power of the newly created currency, the financing of businesses was comparatively simple. The increasing capital impoverishment of Germany was hidden by the paper-money screen. With increasing depreciation the paper mark has lost its money function as a "store of value"; money capitals, originating in the time before inflation, have depreciated, while the accumulation of savings has become without significance [1] because cash deposits in savings funds and banks have depreciated daily. The creation of some new means of payment has been made necessary by the lack of credit and the collapse of the paper-mark standard.

Because of the decline in the mark and the rise in prices, the prosperity of manufacturing enterprises has become more dependent upon fortunate financial direction and the correct choice of methods in the securing and placing of money capital than upon technical efficiency. The amount of money needed for current operations has, on account of the continued depreciation of the mark, become immense. Capital impoverishment has aggravated the difficulty of supplying industry with the funds needed. The money printing presses of the Reichsbank can at the moment not keep pace with depreciation and the consequent increased need for means of payment. Substitutes for state money such as bank checks, city money, railroad money, and "Notgeld" (emergency money) of certain industrial firms only insufficiently supply the need for cash.

I

The need for working capital on the part of German manufacturers has been increased through the lowered performance of workers and through increased unproductive expenses, as well as through the international increase in raw material prices, depreciation of the mark in foreign countries, and through the increases in wages in Germany itself. The time required for processing raw materials has lengthened because of the absolute and relative decrease in performance of labor. It is estimated that present efficiency is only from 50 to 75% that of pre-war times. A shortening of the production process through greater efficiency would, of course, increase the turnover of working capital and decrease the need for capital.

Unproductive expenses (overhead) have increased alarmingly. The new taxes introduced since 1919 and their

[1] In the year 1914 savings amounted to the equivalent of 4.9 billions of dollars, while at the end of 1922 they amounted to only 18.2 millions.

collection, the shortening of the working day, the lowered efficiency of clerks, the introduction of wage schedules and their weekly adjustment to falling money values have increased extraordinarily the number of employees in enterprises and likewise the need for working capital. This excess of unproductive activity slows up the formation of new capital in an enterprise because a greater part of the profit is consumed by administrative expenses. The rise in international commodity prices in connection with the rise of foreign money rates in Germany has augmented the need of financing capital and has shifted the relationship between cost of materials and wages in the product to the advantage of raw materials.

With increasing depreciation, operating incomes, so far as possible, had to be made constant in value. Surplus working capital was invested in foreign securities and foreign bills of exchange, goods, shares, or mortgages secured by tangible values such as barley, potash, coal, or gold were purchased. Claims expressed in terms of marks were changed into foreign currencies and into tangible capital.

Likewise, price determination became an important feature of financial policy during depreciated currency. The selling proceeds of products had to be so large that a reproduction of the product became possible. Not merely the actual outlay for manufacture, but the reproduction cost had to be considered as the real cost to the buyer. This method of price fixing assured financial means for the continuance of the enterprise on its previous scale. In short, the maintenance of the principal of investments and the protection against losses through depreciation of money have governed the financial policy of German industry. Continuing depreciation has rendered it impossible to reckon the selling prices of products in marks. When the purchaser insists upon paper mark prices, his wish is granted only if the price is left open or with suitable price reservations. The losses through currency depreciation between the day of order, the delivery, and the payment in the case of domestic sales are lessened through large additional payments or surcharges on the selling price or through prepayment of the entire invoice. There exists then at present financing of orders by the purchaser in a way which has not prevailed in economically peaceful times.

II

In terms of paper marks, the addition of new capital through increased capitalization of existing corporations and through the change of enterprises into corporations has been very important. In the year 1922 capital increases of corporations amounted to 46.03 billions of marks; the formation of new companies amounted to 12.69 billion marks, to which should be added 6.1 billion marks of bonds. From January to the end of September, 1923, 240.85 billions of marks of shares were issued, although only a few bonds payable in paper marks. On the other hand, the demand of the capital market for constant-value loans, whose nominal value rests not upon marks but upon commodities, has grown from month to month. The true nature of transactions in the money and capital market has been concealed by the currency depreciation. The sums involved must each time be reduced to gold marks; for this purpose one may use as a basis the wholesale index. Thus analyzed, there were 2 billion gold marks in the year 1921, in the year 1922 only something over 0.3 billion gold marks of capital

stock issues, while in the pre-war period the annual issue averaged 3.6 billion gold marks. It seems, therefore, that there has been an extraordinary weakening of the German capital market and that the formation of new capital has not kept pace with the depreciation.

Several industrial firms have established their own banking institutions in an effort to attract money deposits; through acceptances these banks hoped to create money capital both at home and abroad. The attraction of new foreign capital through credits, foreign participation in capitalization of German enterprises, and the acquisition of shares by foreign interests is an obvious consequence of the depreciated standard and one which is needed for the reconstruction of economic Germany. A statistical figure or even a rough estimate of foreign capital in Germany cannot be secured, though one may easily observe that English, Dutch, and Czecho-Slovakian firms are interested in a large measure in German industry.

The formation of branch factories and sales branches of German firms in gold-standard countries has often been regarded as "flight from the mark." This is in part false. The conditions of production in many foreign lands are more favorable. The money conditions are more constant than in Germany. The incomes of these firms in foreign lands have constituted a strong financial support of the German parent house.

III

Bank and other loans constitute the most important form of financing in times of inflation. In the beginning stages of the German money depreciation the cost of credit capital—namely, the bank interest rate—was out of adjustment to the profitableness to the enterprise using that credit. Interest payments played little part in cost of production. The enterprises borrowed bank credit at a low interest rate in "good" money, used that money to purchase goods, and repaid the loan later in "bad" depreciated money. In this maladjustment of cost of credit and profit from use of credit lay a spur to demand for credit and to an increase in volume of credit money. The outcome was inflation. With the increasing depreciation of money, shortage of credit became serious, and bank interest rate rose to a point unheard of in economically peaceful times (in the middle of October the Reichsbank rate was 90%, the interest at the commercial bank being 6% daily). At present the commercial banks protect themselves against losses from depreciation through "valorization" of the debit amount; that is, in repayment of principal, allowance is made for fluctuations in the exchange market. One billion marks bank money, which was secured when the dollar rate was 3 billion marks, must be paid back when due with 6 billion marks, exclusive of interest, if the dollar meanwhile has risen to 18 billion marks. If the banks do not insist upon "valorization," they charge correspondingly higher interest. This increase of the interest rate must lead eventually to a standstill of production or to a still further increase of currency, which in turn will force a change in the currency system. A change in state currency is in process, while in private transactions other means of payment have taken the place of the paper mark —United States treasury notes, the gold-mark loan of the Empire, and bills of exchange. The prices of industrial products are reckoned on a gold basis—that is, in a stable foreign currency, with preference for the dollar, the Dutch gulden, or the Swiss franc—or in gold marks

and conversion on the basis of the exchange rate on the day of payment.

The borrowing of long-term and short-term money credits in foreign countries and in foreign currencies brings with fluctuating exchange rates a strong speculative influence into financial policy, which is excluded if the credit taker uses the proceeds of export orders to write off currency debts. The uncertainty in world trade and exchange conditions has changed the technique of the financing of commodity imports into Germany. While in pre-war times imports were paid for by bills of exchange or cable transfer, now American exporters, for example, demand a letter of credit at an American bank. These require full coverage or remittance upon the arrival of the documents in Germany. Other banking houses give their export customers an acceptance credit, which is secured through the endorsement of a German bank. These cover the acceptances before they fall due in the foreign country. This new form of pledge credit with German firms is still in process of development.

THE ORGANIZATION OF A STATISTICAL DEPARTMENT

By M. B. FOLSOM

THE purpose of a centralized statistical department was well defined in a letter issued by the President of the Eastman Kodak Company upon the establishment of such a department for that company. It was stated that the statistical department should be:

> . . . . a department in which statistics regarding all phases of the business will be centralized.
>
> It will be the function of the statistical department to analyze the statistics now being compiled; to prepare reports and graphic charts for the executives based upon these statistics; to suggest the compilation of further information considered necessary and the elimination of any statistics considered unnecessary.

The prime function should be to analyze and correlate statistics regarding all phases of the business, and present these statistics in graphic or summarized form to the executives.

The decision as to whether the function of the statistical department should also include the compilation and tabulation of data depends in a large measure upon the internal organization. If a statistical department were established at the organization of the company, it would be advisable to include this function in the statistical department, but since the statistical department is a recent development in corporate organization, it must be so organized as best to fit in with the existing departments. If other departments are already compiling the necessary statistics regarding the various phases of the business, the statistical department can perform its functions without handicap by receiving copies of the reports and data compiled. With an arrangement of this kind, the head of the statistical department should have control of the nature of the data to be compiled and should suggest the compilation of new data or the elimination of any data no longer considered necessary. He should also have control over the methods to be used in the tabulating and compiling departments.

The department which merely compiles data and sends reports to the executives is not performing the functions of a statistical department in the sense that a statistical department is to be considered in this outline. This is purely a routine function which can be done in either the statistical department or accounting department. In the larger organizations, this compilation is done chiefly by tabulating machines, the operators of which can be easily trained.

Organization

In order that the statistical department may develop to the fullest extent and cover all phases of the business, it is very important that the head of this department report directly to the president or the general manager. If the line of responsibility is to the official in charge of only one division of the company, the statistical department will probably either concern itself only with the work of that division or else devote more than the proper proportion of its activities to that division. In those com-

panies where it is desirable from an administrative point of view to have a statistical department for each of the major divisions of the company, there should be some central control or a central statistical department.

If the administrative offices are separated from the factory, a statistical department could be located within the factory, the function of which would be to furnish statistics to the factory manager, the departmental superintendents and others regarding the operations of the factory. This factory statistical department should keep in close touch with the central statistical department located in the administrative offices. If practicable the central organization should have control as to methods and data to be compiled in the factory statistical department. An arrangement of this kind is ideal because the factory statistical department is in a position to furnish data to the central department, and likewise the central statistical department furnishes data to the factory department.

The analysis and correlation of reports requires a person with a keen analytical mind, who can see the purpose of the analysis and can visualize a statement from the point of view of the executive. It will be found that young graduates of the collegiate schools of business administration prove to be the best prospects for work of this kind, although any college graduate with an aptitude for figures, who ranked well in his class, should be a good employee for the department. The experience acquired from two or three years' work in the statistical department should prove to be of considerable value to the young employees, as they have access to the statistics of all phases of the business —a background not generally available to many employees. For this reason, some concerns use the statistical department to a certain extent as a training department. Great care should be taken in the selection of employees for this department. It is very desirable that they remain with the company because of the value of the training they have received and because of the confidential nature of the statistics handled.

Methods

The prime function of the statistician is to furnish information in concise form to the executive to aid him in controlling the business. The statistician should therefore first find out the information which the executives are already receiving.

A. Centralization of Reports. Copies of reports issued by the compiling departments for executives should be sent to the statistical department directly upon its organization. After a careful survey has been made of these reports as to their purpose and necessity, it will probably be found that some reports are not being used by the executive because their original purpose no longer exists, others are too voluminous and detailed for the executives to read, and others are unnecessary. The survey will also bring to light many changes that should be made in these reports and will suggest additional reports that should be prepared. This survey will give the statistician his inventory of what information has already been compiled for the executives and will indicate to him the gaps to be filled and the "deadwood" to be removed.

The statistician should make a study of the entire business, list the important phases, the principal problems, and the chief functions of the various divisions. A detailed comparison of these lists

with the data which the executives are receiving will reveal whether the executives are getting all the information they need for the control of the business.

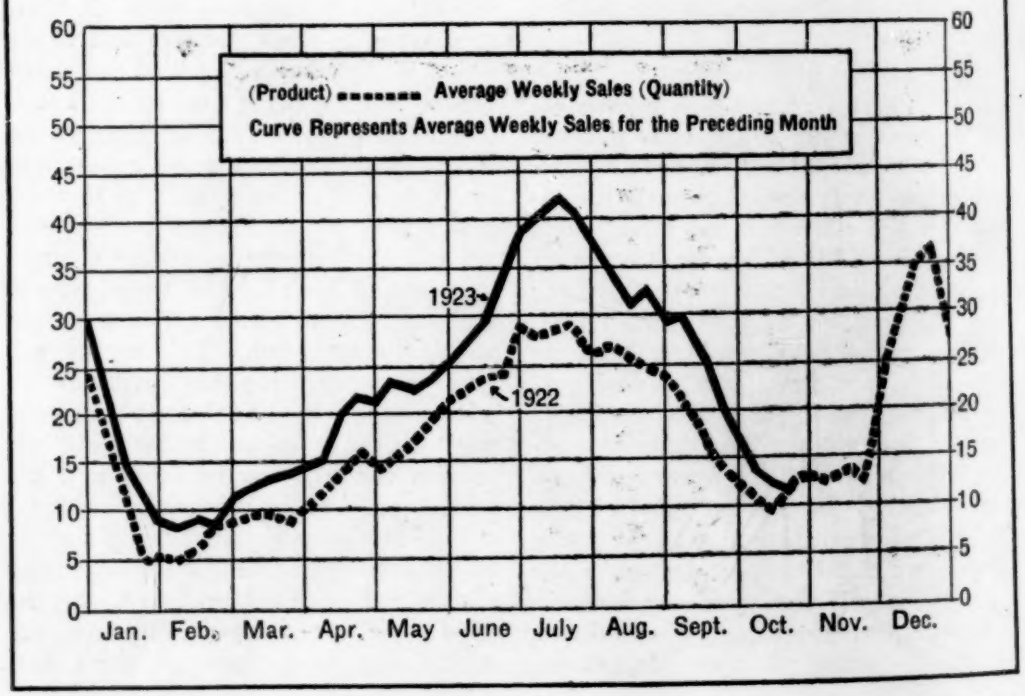
A study of this kind cannot be completed at once, but as the statistician works with the data already being compiled, many new angles of the business will occur to him. The contacts which the statistician forms with the executives will be of great assistance to him in getting the point of view of those for whom he is working.

B. Method of Presentation. After the statistician has made a study of the information which the executive is now receiving, he should first endeavor to present the data in the best manner possible. Graphic charts are now generally accepted as the best method. The saving in time on the part of the executive, the great value in showing trends which cannot be shown by columns of figures, and the comparison of related subjects are some of the reasons for the now general acceptance of the graphic chart idea. The standard size charts, which measure 8½ x 11 inches, are desirable for practically all purposes.

Daily charts are not used to a large extent for the higher executives. Daily reports of operations are seldom significant and the charts will reveal little of value. Daily charts of prices of important materials subject to daily fluctuations, of foreign exchange, and so forth, are often desirable. The year-by-day chart is very useful for presenting such data.

The weekly chart—year by weeks—can be used to great advantage. If the weekly figures show wide fluctuations, the four weeks' moving average will

Chart I



iron out most of these fluctuations and will give an excellent chart of current operations. (See Chart I). This chart has been found particularly useful in comparing the weekly sales of the principal groups of products for the current and preceding years. It is sometimes desirable to add a fifty-two weeks' moving average to the four weeks' moving average chart.

Since most data are compiled on a monthly basis, monthly charts are used more than any other one type. The year-by-month chart showing monthly data for two or three years in comparison and the chart showing cumulative data by months are in general use. In addition to these two charts, a five-year-by-months chart showing the monthly data and the twelve months' moving average is very useful.

The five- or ten-year-by-months chart is useful in showing long-time trends. Since seasonal variation often makes it difficult to detect the trend of the monthly figures, the twelve months' moving total or average is used extensively.

A single chart showing the current monthly figures and the twelve months' moving average gives the executive in many cases all the information which he desires.

Ratio charts are being used more generally. These charts are particularly adapted to showing rates of change and to comparing relative changes in series of widely differing magnitude. The ratio chart is also useful in studying long-time trends and plotting normal growth lines.

All of these charts are the control charts plotted and circulated periodically to the executives. In addition to these, the statistical department will prepare series of special charts, such as bar charts, circle charts, and various other forms, described in a number of excellent books which have been written on graphic charts.

Neatness and clearness are essential requisites of the chart, and it is very important to have a good draftsman in the department. In fact, most statistical departments will begin their career with only the statistician and a draftsman.

The question often arises as to whether the chart should contain figures. If the chart is to fulfil its entire function, figures are not necessary, and on many charts prepared for the higher executives the figures are omitted. It is distinctly helpful in reading a chart to have the identity of the curve shown by placing its title adjacent to it in the field of the chart.

Another important factor is that the charts must be presented to the executive before the data become too old. A schedule should be prepared of the dates on which the individual charts are to be sent to the executive and every effort made to follow the schedule. This will necessitate a close follow-up of the receipt of reports from the various departments.

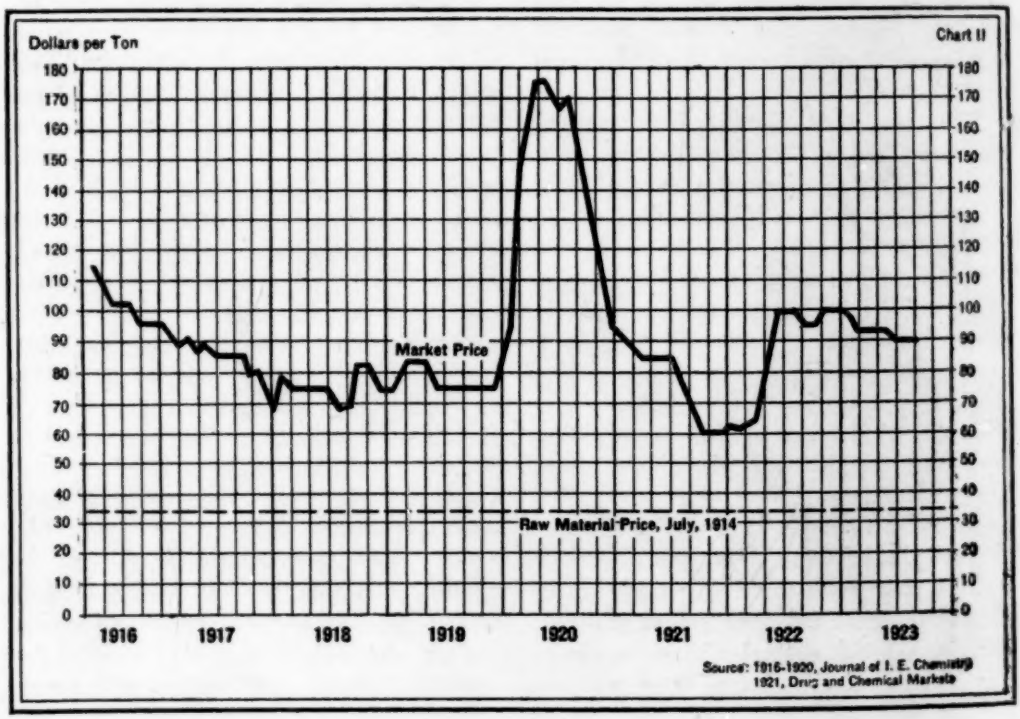
Great care should be exercised by the statistician in the manner in which the charts are presented to the executives. For a number of executives no missionary work is necessary, as they are already familiar with the graphic idea, but in other cases it will be necessary to "sell" the idea to the executive. It has been found that the best plan to follow in presenting the charts is to send the executive a few charts at a time, probably every day, and to have him return the charts to the statistical department when he has finished with them. In this way the executive spends only a short time each day in glancing over the charts, but within the course

of a month he will have received charts concerning all phases of the business in which he is interested. He will receive each day or week charts concerning those phases of the business in which he is particularly interested. The attention of the executive should be called to any unusual factor noted on the chart and these conditions explained.

C. MONTHLY SUMMARY. A logical development from the use of monthly charts is the monthly summary covering the important phases of the business. Such a summary is especially useful for presenting statistics to the president or the chief executive. This monthly summary, which should be freely illustrated with charts, would contain (1) a current history of the important phases of the business, (2) results of any special investigation, (3) a brief summary of current business conditions, (4) comparisons between the business of the company and general business conditions, and (5) forecasts. The material in the summary and the method of presentation should be changed monthly, as an effort should be made to keep the summary from becoming a standard, routine report.

Special Investigations

One of the most important functions of the statistical department is the conducting of special investigations and research into specific problems. From a thorough analysis of records, the statistician is often able to bring to light conditions which have escaped the notice of the executives. These investigations afford the best opportunity for showing the executives to what extent statistical methods can be applied to business problems. They may be conducted at the direction of the executives, but often they can be conducted on the initiative



of the statistical department. The importance of having the head of the statistical department report to the president is particularly evident in the case of special investigations. The problem may lead the statistician into a study of conditions which affect several departments of the business, and he is handicapped if it is not well understood that he has the authority to make these investigations. When upon completion of the investigation the statistician has reached certain conclusions, he should not hesitate to have his report contain definite recommendations, clearly pointing out the facts on which the conclusions are based.

Scope of Statistical Work

It should be the aim of the head of the statistical department to do no work or conduct no investigation which can not be of some practical use within the company. This does not mean that every investigation or every study which the department conducts will be of practical value, because it will be found that a number of studies are made which do not bring to light any conditions which can be changed with profit. The investigations, however, should be made with some practical use in view. It is not thought that the statistician of a business organization should devote his time and efforts to the study of the theoretical side of statistics, but should leave this to other statisticians. The aim should be to have the statistical department closely connected with the actual operations of the business and not to have it develop into a pure research department. The statistics regarding seasonal variation and secular trends should be used in planning production; statistics collected regarding sales conditions should be used by the sales department as an aid in increasing sales; the statistics of price trends and inventories should be used to assist the management in deciding the purchasing policy, stock limits, and the increase or decrease of inventories; the collection of statistics regarding wages and cost of living should be of assistance to the management in the study of wage scales; the normal growth lines and construction cost indices should be brought to the attention of the management for use in deciding upon future expansion and the time to undertake building programs. In other words, the work of the department should be tied up definitely with the operating departments of the business.

The diagram on page 190 (Chart VI), showing the statistics actually handled by the statistical department of the Eastman Kodak Company, illustrates the subjects which may be covered. In order to give an idea of the nature of the work which has been done and the methods which have been used in this department, a brief summary will be given of some of the more interesting phases of the statistical work.

Purchasing

When an attempt was made to chart data regarding inventories and purchases, it was found that very little information was being compiled. It was therefore decided to compile complete statistics regarding the principal raw materials used. This has developed into one of the most interesting functions of the department. Charts have been plotted of the monthly prices of each material since 1914, such as Chart II. A combined index number of the prices of raw materials has been computed for each of the two larger factories. The correlation between these index

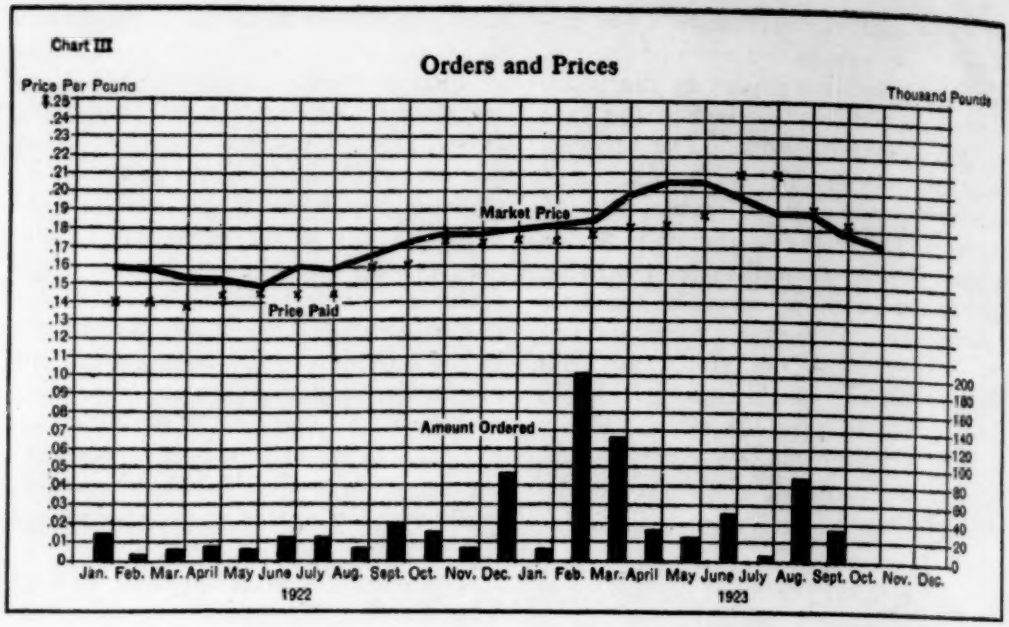


Chart III
Orders and Prices
Price Per Pound
Thousand Pounds
Market Price
Price Paid
Amount Ordered
Jan. Feb. Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. April May June July Aug. Sept. Oct. Nov. Dec.
1922
1923

numbers and the general commodity index numbers has been closely studied.

In addition to the price trend charts, two other monthly charts have been prepared for each of the more important raw materials, one chart showing (1) size of orders placed, by means of bars, (2) prices paid, by means of crosses and (3) a curve of the market price (see Chart III); the second chart showing (1) a curve of the quantity inventory at the first of the month, (2) a bar showing the receipts during the month and (3) a curve of the consumption during the month. (See Chart IV.) From the second chart the executive is able to see at a glance the relative size of inventories in months' supply by comparing the inventory line with the line indicating consumption. From the first chart he can see whether the purchasing department places orders at the right time. These charts are kept in a loose-leaf binder with the two charts for the same material facing each other.

As a guide to the executives in judging the market conditions of materials, all statistics available from outside sources that would throw any light on the probable trend of the market have been plotted. Considerable data, such as production, shipments, stocks, imports and exports, have been found regarding some raw materials, but data regarding other materials not so generally used have been meager. A study is being made of all the factors which can be plotted, in an effort to determine whether there is a definite correlation between certain factors and price trends, as an aid in forecasting the price.

In addition to furnishing this information in chart form periodically, the statistical department prepares a monthly report regarding the commodity price situation in general and the price situation of Eastman Kodak Company raw materials. The statistical department does not actually recommend the increasing or decreasing of inventories, because it is realized that there

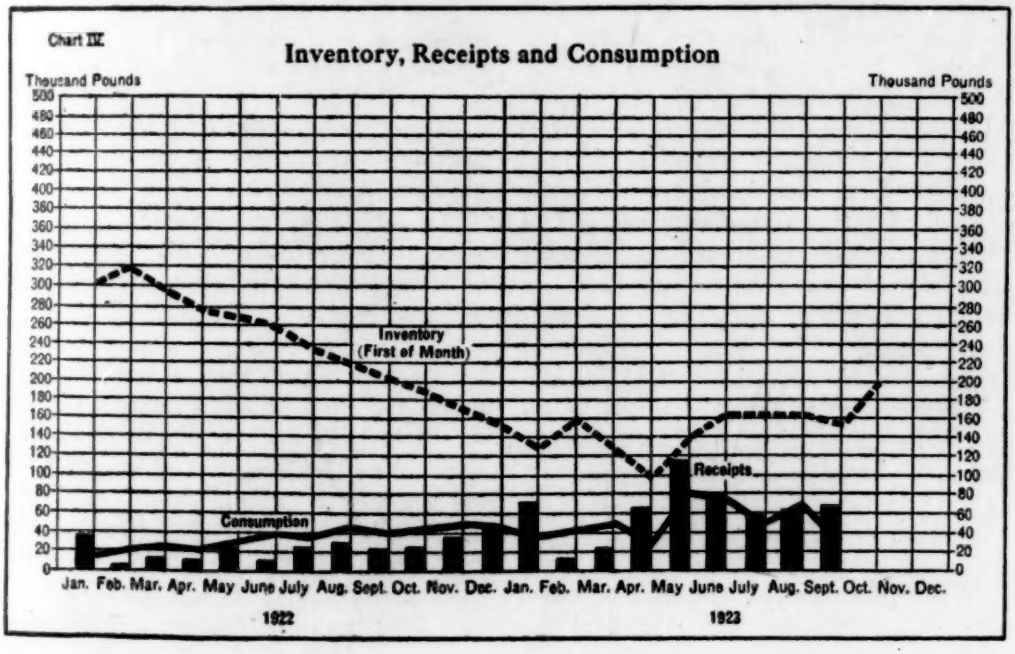
may be certain factors in the market which can be ascertained only by those who make the purchases. It is considered the function of the statistical department to bring to the attention of the purchasing department all the information which would throw any light on the probable price trend, and it is, of course, left to the purchasing department to act as it sizes up the whole situation.

One good illustration of the function of a statistical department was a study that this department was asked to make of one of the important raw materials used by the company. After a thorough investigation, a report was prepared showing the general price trends, production and consumption, the factor that the company represented in the market and a study of the company's method of purchasing. Several conditions were brought to light which resulted in a complete change in the method of purchasing.

Production

One of the most interesting series of production charts prepared is a set called "employee efficiency" charts. A chart is prepared for each process or department, showing the number of hours required to produce a certain number of units monthly from 1914 to date. Since this chart is based upon quantity production, changes in prices and wage scales have no effect upon it. The fluctuations are produced either by changes in the employee efficiency or changes in methods. The chart, therefore, forms one of the best controls that the factory manager can obtain.

A number of control charts are kept of costs, outputs, wages, and burden. The cost and output curves are plotted on ratio chart paper. The monthly chart contains curves of the output, the total cost and costs of the principal elements, such as labor, materials, packing supplies, and expense. By the use of



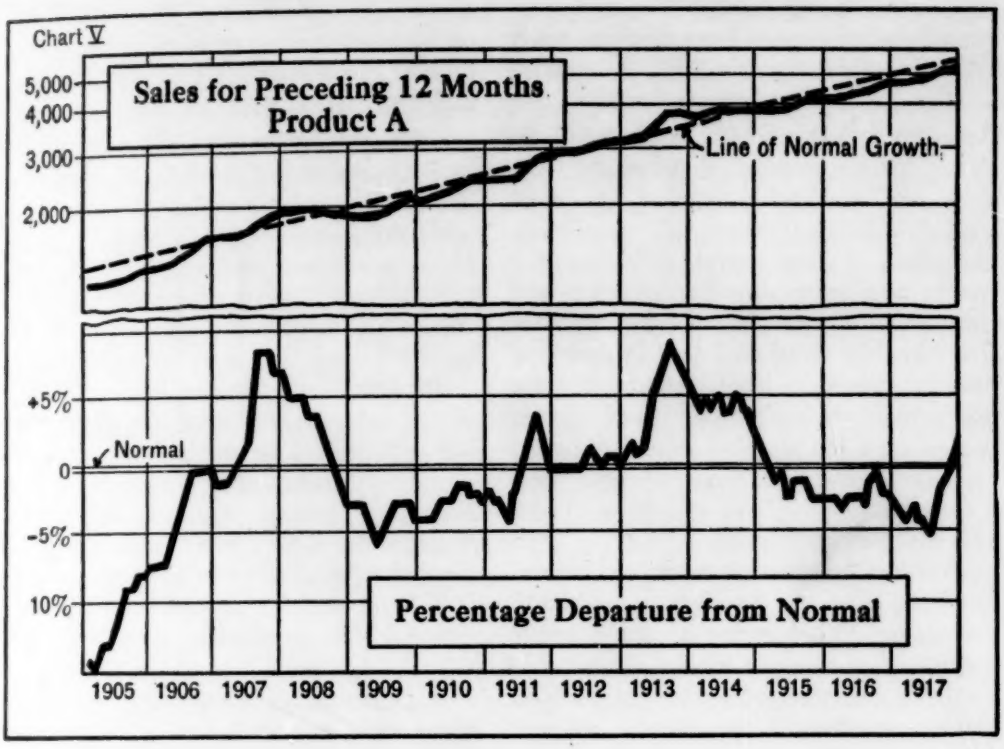
ratio paper, all the curves can be plotted on one chart and the relative importance of the fluctuations correctly shown. The 12 months' moving average is also plotted for each curve, so that any effect of seasonal variation will be eliminated. This chart, therefore, contains complete information regarding the department's operations and is a very useful control chart. The moving average curve is significant in showing waste percentages, as these percentages are apt to show wide fluctuations, and the executive is particularly interested in the trend.

When the department was first organized, these production control charts were furnished to the vice-president in charge of manufacturing and also to the factory managers. Some time ago a statistical department was organized in the largest factory. The functions of this department within the factory are similar to the functions of the central statistical department. It furnishes charts to the manager and the departmental superintendents regarding the various phases of the work within the factory. These charts go more into the detailed operations than the charts prepared by the central statistical department. The factory statistical department has done considerable work in the control of material and supplies and in the preparation of detailed planning schedules after the master schedule has been furnished by the central planning department. The factory statistician keeps in touch with the central statistical department so that there will be no duplication of work and the two departments can be of assistance to each other.

Planning

When the central planning department was organized, the statistical department made an exhaustive study of the sales of the principal products during the past 20 years, so that the planning department would have the proper basis upon which to make its calculations. The effort was first made to determine the normal seasonal variation in sales, which in certain lines, especially Kodaks and Kodak film, is very marked. It was surprising how closely the seasonal variation for the different years agreed, and it was therefore not difficult to plot a normal seasonal variation curve. The sales of the principal products were also plotted by months on ratio charts in order to determine the secular trends. In the case of one important product, it was found that the 12 months' moving total line when plotted on a ratio chart was practically a straight line, and the secular trend was easily obtained. (See Chart V.) In the case of other products, the sales of which vary more with the business cycles, the secular trend was not so easily determined, but a definite percentage of the normal increase has been computed for each of the principal products. Both the seasonal variation indices and the normal growth percentages are being constantly used by the planning department in preparing the production schedules.

To be of further assistance to the planning department in the preparation of manufacturing schedules for several months ahead, the statistical department has been trying to obtain definite barometers for the sales of the principal products. A study has been made of the correlation between Eastman Kodak Company sales and certain indices during the past 20 years. Some of the indices studied have been (1) Bank Clearings (outside New York City), (2) Price Indices, (3) Employment Index, (4) Harvard "B" Curve. A well-de-



fined correlation has been found between the Employment Index and Eastman Kodak Company sales, and also between the Harvard "B" Curve and Eastman Kodak Company sales.

It was found, for instance, that there is a well-defined lag between the Employment Index and our sales. The Employment Index, showing the number employed throughout the country, turns up before the curve of our sales —the length of the lag has varied, but the average lag for the past 20 years gives us a good yard-stick to use in predicting when the upturn in our sales will occur. The last upturn came within one month of the month that it was predicted by the use of this average lag. A well-defined lag in the downward turns was also found.

A similar lag has been found between the Harvard "B" Curve and our sales. Sales have been computed as a percentage above or below normal, using the same method used by the Harvard Committee, and curves have been plotted showing the comparison between the Harvard "B" Curve and the sales of the principal groups of products.

One of the principal aims of this study has been to give us some means of advising the planning department when to expect a turn in business. As a basis for estimating sales, the planning department uses a twelve months' average, a nine months' average, six months' average and three months' average, the last three being corrected for seasonal variation, plus a business factor.

Sales

Very complete sales statistics were being compiled before the statistical de-

partment was organized. A large number of charts is now kept of these sales statistics, showing the periodical sales of the principal products and groups, the sales trends and the correlation between certain groups of products. Besides the weekly charts of the four weeks' moving averages, previously described, a large number of monthly charts are used showing current and cumulative data. In addition to this, the monthly data and the 12 months' moving averages are plotted on ratio paper to show the trends. Ratio paper is also used for plotting annual data for 20 years back, so that the long-time trends in the principal groups of products can be determined.

Another interesting series of charts has been prepared for certain products, containing (1) a curve of the quantity inventory at the end of the month and (2) the quantity sales for the 12 preceding months. These charts are useful in controlling the size of the inventory of the finished products, as they show the number of months' supply on hand and the trend in sales.

For many years, sales have been analyzed by dealers, cities, and states. These statistics had been used by the sales department chiefly for comparing the sales of the current year with the preceding year. One of the principal functions of the statistical department has been to make a more exhaustive study of these statistics for the purpose of ascertaining those cities and states which might show sales to be below normal.

The first step was to compute the per capita sales of the states and cities, based on the total white population. The basis has since been changed to literate white population of 10 years of age and over. The normal per capita sales have been determined for each of the six groups of cities, the cities being grouped according to population. Semi-annual statements are prepared showing (1) per capita sales of each city over 10,000 population, (2) the normal per capita sales and (3) the percentage of change in current sales as compared with the previous year's sales. These cities are arranged according to sales territories and each salesman receives a copy of the statement for cities in his territory.

In analyzing the results of the per capita sales, it was soon found that allowance should be made for differences in the purchasing power for photographic goods. Considerable effort has therefore been put into the preparation of a purchasing power index. The following factors are now being used for the state purchasing power indices:

1. Number of persons reporting income over $1,000.
2. Average income, obtained from the *Distribution of Income by States in 1919*, published by the National Bureau of Economic Research.
3. Automobile registrations—passenger cars.
4. Proportion of dwellings equipped with electricity and telephone.
5. Expenditures for luxuries and pleasure, estimated from the excise taxes published in the *Annual Report of the Commissioner of Internal Revenue.*
6. Magazine circulation.
7. Interest in education, based upon (1) the expenditures for education and (2) the relation of the daily average attendance at school to the total number of children between the ages of 5 and 18.
8. Foreign-born population.
9. Rural population.
10. Scenery and resorts.

Each one of these factors is reduced

to a per capita basis, with the exception of Number 4, which is reduced to a per dwelling basis, and Number 10. Index numbers are computed for each state in each factor, the states being arranged in rank from highest to lowest and the median state being considered as 100. A weighted index is computed for each state for all the factors combined. The income and automobile factors have been given heavier weighting than the other factors. From a field investigation conducted among a large number of possible users of Kodaks, a high degree of correlation was found between automobile owners and camera owners. This furnished good proof of the accuracy of this factor in determining the purchasing power for photographic goods.

The index numbers are also prepared for the state per capita sales. The comparison between the index numbers of per capita sales and purchasing power is shown by means of shaded map charts. The states are divided into six principal groups, each group being given a distinctive shading. The index number is also shown for each state. By reproducing on the same sheet the map chart of the purchasing power indices and the map chart of the per capita sales indices, a comparison can easily be made for each state. It can be readily determined which states show a higher rank in purchasing power than in sales.

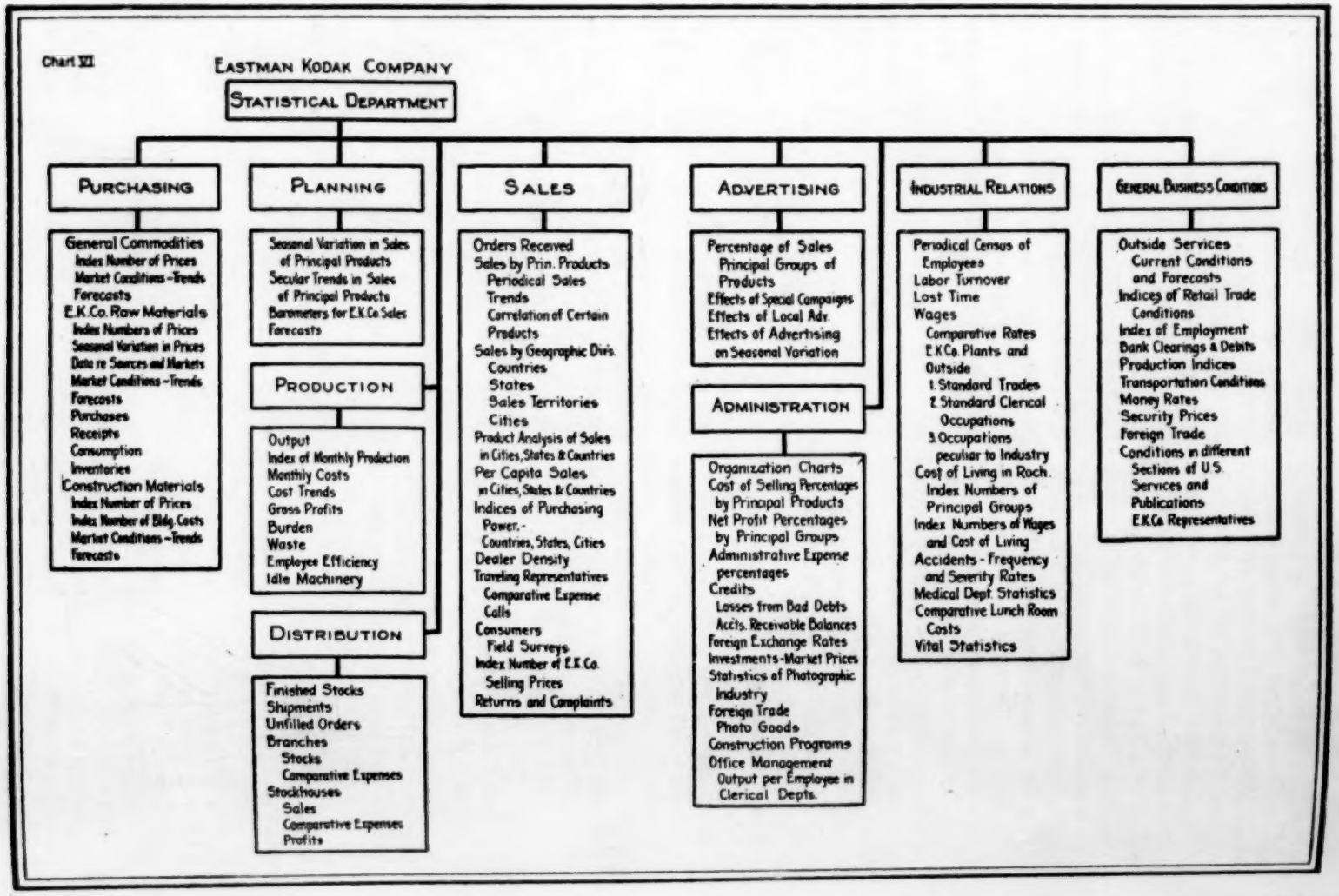
A detailed analysis is made of each of the states showing lower sales than the purchasing power would seem to warrant. The per capita sales of each city in the state and the rural sales are studied to determine in what localities the sales are weak. It has not been possible to obtain as much data regarding the purchasing power of cities as of states, but more data constantly are becoming available. A study is also made of the dealer situation in each of the localities which seem to show low sales. A distribution percentage is computed for each city, this figure being the proportion of dealers to the total number of possible dealers.

It is intended to extend this purchasing power and per capita sales study to include foreign countries.

A quarterly sales report is prepared, containing an analysis of the sales of the principal products by states and cities. This report contains shaded map charts showing the percentage of increase or decrease in the sales in each state as compared with the corresponding quarter of the preceding year. The states are arranged in six groups, a distinctive shading being used for each group, the darker shadings indicating decreases. A separate map is prepared for each of the principal groups of products. An analysis is made of the sales in each state which shows decreases or smaller percentages of increase. This quarterly report also contains a comparison between sales and business conditions for the twelve Federal Reserve Districts. A table is prepared showing by districts the percentage of change in bank debits, postal receipts, retail trade, and sales. This table, together with a map, indicates to the sales department those districts in which our sales do not seem to be keeping up with general business. The quarterly report contains a similar statement for all the principal cities, showing for each city the percentage of increase or decrease in bank debits, postal receipts, retail trade, and our sales.

Two of the special investigations made for the Sales Department were concerned with dealer conditions. In the first investigation, the percentage of distribution was analyzed, showing the

Chart XI


EASTMAN KODAK COMPANY
STATISTICAL DEPARTMENT
PURCHASING
General Commodities
Index Number of Prices
Market Conditions - Trends
Forecasts
E.K.Co. Raw Materials
Index Numbers of Prices
Seasonal Variation in Prices
Data re Sources and Markets
Market Conditions - Trends
Forecasts
Purchases
Receipts
Consumption
Inventories
Construction Materials
Index Number of Prices
Index Number of Bldg. Costs
Market Conditions - Trends
Forecasts
PLANNING
Seasonal Variation in Sales of Principal Products
Secular Trends in Sales of Principal Products
Barometers for E.K.Co Sales
Forecasts
PRODUCTION
Output
Index of Monthly Production
Monthly Costs
Cost Trends
Gross Profits
Burden
Waste
Employee Efficiency
Idle Machinery
DISTRIBUTION
Finished Stocks
Shipments
Unfilled Orders
Branches
Stocks
Comparative Expenses
Stockhouses
Sales
Comparative Expenses
Profits
SALES
Orders Received
Sales by Prin. Products
Periodical Sales Trends
Correlation of Certain Products
Sales by Geographic Divs.
Countries
States
Sales Territories
Cities
Product Analysis of Sales in Cities, States & Countries
Per Capita Sales in Cities, States & Countries
Indices of Purchasing Power, - Countries, States, Cities
Dealer Density
Traveling Representatives
Comparative Expense Calls
Consumers
Field Surveys
Index Number of E.K.Co. Selling Prices
Returns and Complaints
ADVERTISING
Percentage of Sales Principal Groups of Products
Effects of Special Campaigns
Effects of Local Adv.
Effects of Advertising on Seasonal Variation
ADMINISTRATION
Organization Charts
Cost of Selling Percentages by Principal Products
Net Profit Percentages by Principal Groups
Administrative Expense percentages
Credits
Losses from Bad Debts
Accts. Receivable Balances
Foreign Exchange Rates
Investments-Market Prices
Statistics of Photographic Industry
Foreign Trade
Photo Goods
Construction Programs
Office Management
Output per Employee in Clerical Depts.
INDUSTRIAL RELATIONS
Periodical Census of Employees
Labor Turnover
Lost Time
Wages
Comparative Rates
E.K.Co. Plants and Outside
1. Standard Trades
2. Standard Clerical Occupations
3. Occupations peculiar to Industry
Cost of Living in Roch.
Index Numbers of Principal Groups
Index Numbers of Wages and Cost of Living
Accidents - Frequency and Severity Rates
Medical Dept. Statistics
Comparative Lunch Room Costs
Vital Statistics
GENERAL BUSINESS CONDITIONS
Outside Services
Current Conditions and Forecasts
Indices of Retail Trade Conditions
Index of Employment
Bank Clearings & Debits
Production Indices
Transportation Conditions
Money Rates
Security Prices
Foreign Trade
Conditions in different Sections of U.S.
Services and Publications
E.K.Co. Representatives

relation of the number of Kodak dealers to total possible outlets in different states and cities. The second investigation considered the class and size of Kodak dealers. Per-store sales of various classes of Kodak goods were given for dealers in eleven kinds of business covering cities and towns of three size groups. Data were shown concerning changes in Kodak dealer conditions in recent years and general information introduced to show certain merchandising facts about the stores used as most important distributers of the company's products. These two reports included information designed to assist the Sales Department in adjusting numbers of dealers in different sections of the country, and in determining programs for the selection and stimulation of dealers in various classes of trade.

One field survey has been conducted under the direction of the Statistical Department by an advertising agency. The purpose of the survey was to obtain the reaction of both the consumers and the dealers to the Kodak line and Kodak service, with one or two phases in particular to be covered. Seventeen cities in eight different states were covered by the survey. These states and cities were chosen by the statistical department as representing typical localities. The data to be collected were outlined in detail for the agency by the statistical department. Some very interesting information was obtained from this survey.

Administration

A set of organization charts is prepared at the first of each year for the company as a whole, for each subsidiary company, and for each branch or division. An organization chart is also prepared for each department in the executive offices. A standard form has been adopted for these charts and each chart conforms to the standard.

Normal growth charts have been prepared for each of the factories as a basis in planning construction. The floor area, the number of employees, and the outputs have been plotted on ratio chart paper, showing the trend since 1890. From these curves the normal percentage of increase has been determined and the curves projected ahead several years. In connection with the construction programs, charts are kept of conditions in the building industry and of building costs, and forecasts are made of the trends of building costs.

An interesting study has been made of the output per employee in certain clerical departments. As an illustration, monthly charts are kept of the number of items billed per employee in the billing department, the number of postings per employee in the bookkeeping department, and the number of cards punched per employee in the tabulating department. These charts indicate to the department head whether improvements are being made over previous years and also whether the output per employee remains uniform during the year.

Interesting statistical problems have also been met with in the follow-up of results of psychological tests which have been given to certain groups of employees. The statistics of the photographic industry and of foreign trade, which are obtained from Government sources, are charted for the use of the higher executives. The imports and exports of the different groups of products are shown by the use of "river charts."

For the use of the credit department a monthly map is prepared, showing the number of days' sales represented in the accounts receivable balances. This not only shows the credit department those

states in which the collections seem to be slow, but the map is also a good indication of the business conditions in the different sections of the country. By comparing the current map with the previous maps, the credit department is also able to follow the changes in credit conditions in the different sections.

Industrial Relations

The index of the cost of living in Rochester has been compiled, with data dating back to 1914. This is a weighted index of rent, food, clothing, fuel, and light. The index number of rent is based upon information furnished by several real estate agents concerning rates for the type of house rented by the average working man. Retail food prices are obtained from several retail grocery stores located in different parts of the city. The prices are weighted according to the table of relative importance used by the U. S. Bureau of Labor. A typical budget of clothing normally used by the average workingman's family of five was prepared and the retail prices of each article are obtained periodically from two department stores. The retail coal prices are obtained from three different retail dealers. The light index number is easily computed from the published rates of gas and electricity. The weights used for the combined index number of the cost of living are the same as those used by the U. S. Bureau of Labor. The index number of food prices in Rochester has lately been computed by the Bureau of Labor, and this index number is compared with our own index number. The index number of the cost of living for the whole country, compiled by the National Industrial Conference Board, is also plotted in comparison with the Rochester index. The compilation of the Rochester cost of living index has been transferred to the Rochester Chamber of Commerce and the index is now published monthly by that body.

For use within the company, the cost of living index is plotted in comparison with the index numbers of the hourly earnings and weekly earnings of the employees in the different factories.

The statistical department circulates a large number of monthly charts regarding labor turnover, absenteeism, accidents, and other subjects indicated on the diagram on page 189. While some of these charts show the trends, a thorough analysis is made once a year of all the industrial relations statistics and an annual report is prepared in which attention is called to any definite trends that have been revealed during the preceding year. The last report contained 21 charts with 21 pages of reading matter calling attention to the points brought out by the charts. The headings of some of the charts were:

Days Lost on Account of Sickness and Total Days Lost per Employee by Years from 1915.

Percentage of Employees Involved in Absence During the Last Three Years, by Plants.

A Circle Chart Showing Analysis of Lost Time by Causes.

Bar Chart Showing Analysis of Labor Turnover by Causes.

Yearly Turnover Percentages from 1916 to Date.

The Length of Service of Employees Leaving During the Year.

Medical Treatments per 1,000 Employees, Yearly from 1915, and Also by Plants.

Seasonal Variation Chart of the U. S. Death Rate of Pneumonia Compared with the Cases of Respiratory Diseases per 1,000 Employees.

Line Charts of the Number of Accidents per Employee from 1910 to Date; Accidents per 1,000 Employees from 1910 to Date.

Bar Charts of the Frequency and Severity Rates of Accidents by Plants.

General Business Conditions

A number of services giving information regarding current business conditions are circulated among the executives by the statistical department. In addition to these services, the statistical department keeps a number of charts on business conditions, prepared from data contained in these services and other publications. By means of these charts and the Monthly Summary, which has been described, the management is kept constantly advised as to the current stage of the business cycle and the most reliable forecasts. Charts are also presented to the higher executives showing how sales are changing with general business conditions. These charts include those which are prepared primarily for the planning department and which have already been described. The charts show the correlation between the forecasting indices and sales during all the business cycles since 1900, and the executive can draw his own conclusions as to the forecasts for the coming months.

If the original aim of the department —to present statistics regarding all phases of the business to the executive— is clearly kept in mind by the statistician, if all the work is done with some practical use in view, and if the statistician is constantly on the alert to learn the business, the statistical department will be able to give the executives of the company a thorough statistical control of all the operations of the business. This work cannot be done within a short time nor will the work ever be completed; conditions are always changing and new phases of the business being presented for investigation.

WHAT CAN THE EMPLOYER DO TO ENCOURAGE SAVING AND WISE INVESTMENT BY INDUSTRIAL EMPLOYEES?

By C. J. HICKS

THE year just past, which has been a somewhat extraordinary one in business, in industry, and in finance, has added significant contributions to that series of developments in labor relationships which has marked the industrial history of the United States during the last decade. The unprecedented advance of industrial relations management during the war and in the feverish years which immediately followed the signing of the armistice is fresh in the memory of each of us. In the business depression of 1920 to 1922 there came a decline and a deflation dictated sometimes by stern financial necessity and sometimes by the notion that advanced policies of labor management were no longer needed, when workers were plentiful, when jobs were few and when wages were falling. It is true that those employers whose industrial relations policies were founded upon common sense and seasoned experiences generally retained their fundamental practices, even though being forced by financial necessity to dispense with some relative non-essentials. Many companies, however, cast aside their advanced labor policies altogether and it is to be feared that in some instances the management believed, and perhaps justly, that it was well rid of a mass of sentimentalism and "uplift" which had no connection with the production of goods and the earning of dividends.

This phase was followed in its turn by a period of fresh progress during the past year. This time, however, personnel administration has been anchored more firmly than ever before to sound principles of economics and of business management. The director of industrial relations and the operating executive have drawn closer together and each one has acquired an understanding of the other's problems, which sometimes he lacked in the past. Upon this substantial basis it is fair to expect that advanced principles of labor management will go forward through periods of prosperity and of depression and that yet further progress will be made in the adjustment of employing relationships on the basis of fair dealing and cooperation.

I

One of the facts which has stood out in all the changing experiences of the last decade in industrial relations is that in the mind of the worker nothing can take the place of fair financial treatment. The employer whose wage scales are not up to the standard of the industry or of the locality is under a heavy handicap if he attempts to supplement the pay envelope with other elements supposed to be for the benefit of the workmen. It is not true that the working man is interested solely in his daily or weekly pay; it is true, however, that like every other section of the business community, he expects a fair compensation for his work. Consequently he is likely to have scant enthusiasm over any arrangement suggested by his em-

ployer which does not include this fair compensation.

But the financial incentives which may be offered to labor do not end with the pay envelope which has been handed from the cashier's window. Many advanced thinkers in the ranks of employers and workmen and of the general public believe that some extra inducement may wisely be provided. These extra financial incentives have taken numerous forms. Among the most important of these as well as among those most closely connected with the wage relationship are, first, profit sharing, and, second, stock participation.

The subject of profit sharing has attracted wide attention. To many thinkers, both on the side of labor and of management, it presents fascinating possibilities. Moreover, it has been adopted by a number of American industries and in some cases has proved well adapted to the needs of the business. On the whole, however, its record is not impressive. In many cases it has been abandoned after trial and in general it may be said that at the present stage of American industry profit sharing when applied to the wage-earner is an experiment, the demonstrated utility of which is much in doubt.

Those who have favored profit sharing generally have based their arguments upon two principal assumptions:

1. That the worker having received fair wages for his labor is entitled to some share in the profits which he has helped to earn.

2. That when the worker's earnings depend in part upon the success of the business, he will be more efficient, less wasteful and show more interest and loyalty.

The first of these arguments is open to grave objections. From the standpoint of the business world today it is a matter of extraordinary difficulty to establish any right of the worker to a share in the profits which normally belong to the stockholder. If wages are too low or if the income of the business reaches a level which troubles the conscience of the employer, the remedy lies in a revision of wage rates or of price rather than in a splitting of profits with the working force. Moreover, it is generally admitted that in the ordinary business, the employee cannot afford to share in the losses of bad years and this admission in itself deals a heavy blow to the theory that profit sharing is justifiable as a matter of right.

We are thus thrown upon the second argument in favor of profit sharing; namely, that it is of direct advantage to the business through increasing the worker's efficiency, loyalty and economy. Here we are not dealing with abstract economic principles, but with questions of facts and expediencies which must be worked out with a view to conditions of particular industries. Here, as stated above, experiences have been diverse and seem to point to nothing more definite than that profit sharing is a good thing if it works. Even from this standpoint, however, there is food for thought in the very slight connection between the efficiency of the individual wage-earner and the earnings of a business as a whole. It is probably true that labor reaches its maximum efficiency during periods of business depression when in the average industry there are likely to be no profits for stockholders or anyone else. In just such a period it would seem that the advantage of profit sharing largely would be lost through the fact that the wage-earner receives nothing and that the system temporarily or permanently breaks down.

II

Differing distinctly from profit sharing in principle and in practice are the numerous plans which have grown up for encouraging thrift and investment on the part of the wage-earners. Large numbers of these plans, varying widely in detail and even to some extent in principle, are in operation in various business organizations.

Behind these plans there are two general purposes:

1. Forward-looking employers generally have come to believe that the workman who saves a part of his earnings and becomes a thrifty and self-sustaining member of the community is more valuable even from the standpoint of production and dividends than is the spendthrift who flees to his employer or to the community for aid at the first emergency of illness or hard times. Many employers believe that the attainment of this end alone is important enough to justify the expenditure of some of the stockholders' money for the encouragement of thrift.

2. If in addition to the saving of a part of his wages the workman invests these accumulated funds in securities of the company by which he is employed, a distinct gain is achieved through making the wage-earner a partner in the business.

For an industry, therefore, which can and ought to sell its own stock to its employees, a properly devised and administered stock participation plan should increase efficiency, economy and loyalty on the part of the working force and thus aid to reduce labor turnover. This, as a matter of fact, has been the result in the experience of many American employers.

Along with this result have come others of scarcely less importance. Workmen investing in sound securities and under wise guidance gain valuable understanding of economics and of business principles—an understanding which is admitted to be one of the outstanding needs in labor relationships. Then, too, the worker who has a financial stake in his employer's business or in business in general and who feels himself a partner rather than a servant is unlikely to become a convert of the evangelist of destructive radicalism.

But the recognition of the theoretical soundness of stock participation does not imply that the practice is suited to the needs of every industry or that even when the conditions in the industry are favorable any kind of a plan, however devised, is certain to bring good results. There are fundamental conditions and essential principles which need to be kept in mind. It will be worth while to turn our thoughts, therefore, to some of the essential features of a plan of stock purchase.

First, whatever device is adopted it should provide for automatic savings with the encouragement of the employer. Experience with war loans demonstrated the influence of the employer in developing the habit of saving on the part of the workman. Management must expect actively to encourage any savings plan in which it wishes the employees to exhibit an interest. But encouragement by the employer is in itself not sufficient. The saving process should be made automatic. All of us could testify from personal experience as to the difficulty of refraining from spending money once it has reached our pockets or our own bank accounts. Particularly for the laboring man there is a distinct advantage in an arrangement which permits the saving of money before he gets it. This in practical effect means deduction from the payroll, nat-

urally only upon the authorization of the employee.

In the *second* place the employer is bound to provide proper safeguards for the keeping of such funds pending investment, that there may be the minimum amount of risks.

Third, a saving plan to reach its maximum effectiveness should be extended over a long enough period to give the workman a genuine training in the habit of thrift. This means that savings should be made and securities purchased by easy instalments, preferably extended over periods of several years. It is true that most industrial managers believe it wise and equitable to permit the employee to withdraw his money at any time. However, it is best to provide an investment that assures a special inducement, financial or otherwise, to the investor who resists the temptation to withdraw his funds and remains in the plan until payments have matured.

Fourth, and this may be said to be the absolute essential, the savings plan should provide the maximum of safety to the workman's funds. If the plan contemplates only an accumulation to be withdrawn with interest at the end of a specified period, the fund thus accumulated should be safeguarded and preferably should be invested in securities not connected with the business of the employer. Many employers have rendered great service to their employees and to the community by establishing a connection between the employees and the local savings banks. On the other hand, a plan which includes investment in securities should be devised so as to furnish to the employees only such securities as have every reasonable element of safety. The obligation to assure safe investment rests squarely upon the employer, and he has no moral right to encourage the wage-earner to put his money into investments in which he himself would not risk his own funds. The case may be stated even more strongly. Many investments of a speculative nature which are adapted to the needs of the business man or the employer are not suitable for the wage-earner of small means. We may perhaps go so far as to say that the employer ought not to offer to his employees a security into which he would not wish his widow and orphans to invest his estate after his death.

Fundamental as this essential principle may seem it has not always been observed. Unfortunately, there have been cases in which the employer selfishly or carelessly or through faulty judgment has sold securities to employees with disastrous results when periods of depression sent stock prices crashing downward. Even aside from the ethical principles involved, such experiences are extremely unfortunate in their effect upon the morale and loyalty of the working force. A consideration of this element of safety leads naturally to a discussion of the various types of securities that may be offered.

Some companies have gained outstanding success through the distribution of common stock to their employees. This does not mean that every company should follow this example. On the contrary, there are many companies, the securities and particularly the common stocks of which are of such a character that they cannot properly be offered by the employer for sale to the working man. Nor does this statement imply that those companies are fundamentally unsound. It means simply that we must draw a distinction between the investment which is suited to the wage-earner of small income and the one into which the business man

may be justified in putting a part of his income for the sake of speculative profits.

As a matter of fact it probably is true that there are relatively few companies in the United States which have a common stock sufficiently stable to make it a suitable investment for their employees. Even among the more substantial companies whose common stock fluctuates within relatively narrow limits, it often has been found wise to protect the employee stockholder either by selling him his shares at a price measurably below the market or by making a direct contribution which brings his own investment down to a point below which the price of the stock is unlikely to fall.

Sometimes an attempt is made to offset the fluctuation in values of common stock by giving the employee a guarantee against loss. The wisdom of this is questionable; first, because such a guarantee cannot be stronger than is the company which makes it; and, second, because it teaches something about economics which is not true. One advantage of employee stock ownership is that it gives the workman an understanding of business organization and of the functions of capital. This advantage is lost if the employee is not given to understand that if he buys common stock, and thus becomes a partner in the business, he must share the risk.

Some companies have sought to avoid the risk involved in wide fluctuations by selling their employees preferred stock bearing fixed dividends. This practice is to be recommended, especially if the preferred stock carries voting rights. If it lacks the voting power, a preferred stock as an employees' investment does not offer a real partnership and the employer in offering such a stock is likely to give the impression that he fears to trust his workmen with a voice in control equivalent to their share in stock ownership.

For the corporation which has a stock meeting the requirements of stability and voting power and with sufficient quantities available, the employee stock purchasing plan is likely to prove one of the most valuable means of sustaining good relationships between employees and management.

Another primary principle which may be considered almost in the class of essentials is that there should be cooperation on the part of the employing company. The advantages from employee stock ownership or even from thrift without stock ownership have a value to the employer which cannot be measured in dollars and cents, and the management is justified on a business basis in making appropriations to secure these advantages for the company. Many companies, after varying experience, are convinced that they have lost nothing but on the contrary have gained through financial aid toward the purchase of stock by employees. Generous financial cooperation from the company, whether in the form of assuming the expense of gathering and handling the fund, or in the form of a special reduction in the price charged for stock, or in the form of a contribution toward payments to be made—cooperation in one or all of these forms will do much to give the employee an advantage over the ordinary investor and to safeguard him against loss arising from inevitable fluctuations in the market value of common stock.

A *sixth* element, which has entered into the stock participation plans of some companies, is a special inducement to the worker who holds his stock after he has paid for it and is free to sell it if he wishes. This inducement is par-

ticularly important in the case of a stock which has a low earning power and which, therefore, is likely to compare unfavorably in the mind of the worker with other so-called investments that are certain to be offered to him. An incentive of this kind largely takes the form of a special extra dividend to the employee who while still an employee retains his stock for a term of years after completing payment.

III

There are many stock acquisition plans that meet all of these requirements. The one with which I am most familiar is that of the Standard Oil Company (New Jersey). Under this plan employees of more than one year of service are encouraged to authorize deductions from their pay of any amount up to 20% of their earnings. To the amounts thus deducted the employing company adds 50%, and the total sum is forwarded to three trustees who have been appointed by the Board of Directors to receive and care for these funds. The money thus received by the trustees is invested currently in common stock of the Standard Oil Company (New Jersey) at a price that is fixed annually by the Board of Directors at not more than 10% below the current market price.

This Stock Acquisition Plan covers a period of five years, and at the end of that period all stock purchased by the trustees is to be distributed and become the actual property of the subscribers. Employees who, for any reason, are obliged to withdraw from the fund before the expiration of the five-year period are refunded the amount they have contributed, with interest, while the 50% that has been contributed by the company goes to a withdrawal fund which is to be distributed among those participants who remain until the termination of the plan. This plan, which was started February 1, 1921, now has over 14,000 participants, and the amount in this fund is now approximately $13,700,000.

Among the best known of the stock purchasing plans in America is that of the United States Steel Corporation, which has been in effect since 1903. This plan has served as a medium for the distribution of both common and preferred stock, although for the last eight years no preferred stock has been distributed, as it was found impossible to purchase it on the market in sufficient quantities.

The Steel Corporation soon after January 1 of each year offers common stock to its employees at a price based upon the market. Payment is made by deductions from the payroll and it is expected that each block of stock will be completed in three years. Upon deferred instalments interest is charged at the rate of 5%. The corporation limits the number of shares to which an employee may subscribe on the basis of his earnings. Until payment has been completed the dividends accruing upon each block of stock are credited to the account of the purchaser and applied upon the principal. The employee subscriber receives his dividends direct after he has completed payment.

Toward this stock purchasing plan the corporation makes a direct contribution by paying an extra dividend of $5 a year per share for five years to the man who remains in the service of the corporation and does not sell his stock. This brings the employee's investment up to a 10% level for five years, assuming that the stock has been purchased at par. An arrangement of this kind is useful both as a means of

promoting the sale of stock and as a means of holding desirable workmen in the employ of the company. The Steel Corporation plan permits a subscriber to withdraw money with 5% interest any time before his stock is paid for.

There is another type of stock participation under which stock in a company comes to the employees, or to a limited number selected from among the working force, practically as a gift. Of this type of plan a good example is that of the Eastman Kodak Company. Under the stock acquisition plan of this corporation stock to the value of about $10,000,000 set aside by George Eastman and an equivalent amount turned over by the company is sold to employees on terms that make the transaction to all intents and purposes a gift. Under this plan the employee must wait ten years before actually receiving his stock and being able to sell it.

IV

There are three outstanding perils that menace the American workman:

1. The first peril is the peril of indifference or lack of interest in his work.

2. The second peril is the peril of hostility to his employer.

3. And the third peril is the peril of socialism or hostility to private ownership of capital.

Unless I am greatly mistaken, a well-rounded stock acquisition plan is the surest safeguard against all three of these perils. The employee who is saving his money becomes a capitalist and is no longer hostile to capitalism. His ownership of stock in the company by which he is employed makes him a partner in the business; he is bound to regard his fellow partners with friendliness rather than suspicion, and the inevitable result of such stock ownership is to make him an interested rather than an indifferent worker.

Any thrift plan that will assure one or all of these results is worthy of the serious attention and generous backing of every unit of American industry.

THE FEDERAL RESERVE SYSTEM IN ITS RELATION TO INFLATION AND DEFLATION

By SAMUEL W. ANDERSON

THERE has been such a large amount of discussion during the last few years of the functions of the Federal Reserve System that it is natural to assume a fair degree of public education on the subject. In Congress and out of it there have been many statements to the effect that the System is the root of all evils of inflation and deflation as well as that it is the greatest blessing our financial structure possesses.

It is the purpose of this study to examine into what appears to be a neglected distinction between certain functions of the Federal Reserve System in respect to its influence upon the course of inflation or deflation.

I

Among the many functions of the System there are two which stand out as of primary importance, viz:

1. The creation of an elastic reservoir of banking reserves
2. Supplying the country with a sound and uniform currency which will automatically expand or contract with the needs of business

In any discussion of the activity of the System during a period of prosperity or liquidation it is important to keep in mind the significance and practical working out of these two functions of the Reserve Banks.

Let us examine what happens during a period of expansion when the Reserve Banks are functioning normally. What part is played by each of the two important functions of the System in the history of the expansion of such a period?

We have selected the period between June, 1919, and June, 1920, for the reason that during this period, because of the growing intensity of prosperity, each dollar of commercial banking reserve was being utilized probably as effectively as possible. During this period the "slack lending power" of the commercial banks was very limited.[1] We know

[1] Dr. B. M. Anderson (whose treatment of this question is referred to in another note) has selected the period beginning April, 1917. This seems to us an unsuitable starting point, not only because a large amount of "slack lending power" was taken up between this date and June, 1919, but also for another reason. On June 21, 1917, reserve requirements for National Banks were reduced from:

18% for Reserve City Banks to..... 13%
15% for City Banks to..... 10%
12% for Country Banks to..... 7%

on demand deposits. At the same time cash on hand and balances due from approved National Bank Reserve Agents were eliminated from lawful reserve. The reserve requirements of National Banks (whose deposits in 1917 represented 51% of the total deposits of commercial banks) were reduced at a stroke from $1,468,000,000 to $964,500,000 between June 20, 1917, and September 11, 1917. The requirement was computed on practically the same amount, namely, $10,084,000,000 in June and $10,083,000,000 in September. This is a reduction of 34% in actual reserve requirements or from an average of 14.6% of demand liabilities in June to 9.6% in September. Actual reserve held decreased between the two "calls" from $2,310,000,000 to $1,048,000,000 or 54.5% with a percentage reduction of reserves to demand liabilities from 22.9% to 10.4%. The conclusion from this factor must, therefore, be that $1,262,000,000 of reserves were set free between June and September of 1917 to be used again as reserve against new deposit expansion if the banks so elected to use it, or for a reduction of a liability either at the Reserve Bank or elsewhere.

this to be true in general because of the extensive borrowing at the Reserve Banks during this period. During these 12 months the members of the System increased their rediscounts from $1,818,000,000 on June 30, 1919, to $2,432,000,000 on June 20, 1920, or by the sum of $614,000,000. This represents the most direct source of "additional reserve dollars" open to the commercial banks. There is, however, another important source of such "additional reserve dollars." This consists of the increase in the total of "Other Earning Assets" on the Federal Reserve System statement.

Purchases of paper on the market by the Federal Reserve Banks are ordinarily paid for by delivering to the seller a check on the particular Federal Reserve Bank itself. This check is deposited in his own bank by the broker who makes the sale; this bank in turn deposits the check with its Federal Reserve Bank (perhaps through a correspondent if the broker's bank is a nonmember). The check is so far treated much as if it were a check against some other member of the System. When an ordinary transit item drawn against some member is deposited by some other member at the Federal Reserve Bank, the amount of the item is eventually credited to the depositor's account but it is also debited to the drawee's account. The excess reserve balance, which presumably might thus be made available for a reduction in the bills payable of the depositing member, would have to be borrowed by the drawee of the check if we assume that reserves are being utilized as efficiently and completely as possible at the time. The net result on the account "Rediscounts for Members," therefore, is no change at all. When a check on the Federal Reserve Bank itself is deposited by a member, however, the case is different. No corresponding debit to another member bank's account is encountered and the excess balance thus made available to the depositing member bank may be used for the reduction of bills payable without the accompanying necessity of borrowing by another member. For example, the amount of Other Earning Assets (other than Rediscounts for Members) in the Federal Reserve Bank statement increased $215,000,000 between June, 1919, and June, 1920, making available that amount of credit to member banks, which therefore did not need to borrow that amount by rediscounting. It is clear then that the increase in earning assets, other than Rediscounts for Members, should be added to the increase in Rediscounts for Members to get an accurate figure for the acquisition of "additional reserve dollars" during the period.

We have then the sum of $614,000,000 and $215,000,000, or $829,000,000, as the gross amount of "additional reserve dollars" over which member banks were given control during the year in question.

II

Let us now examine the use to which member banks put these "additional reserve dollars." Here it is important to bear in mind the distinction between the two primary functions of the System—(a) the creation of an elastic reservoir of banking reserves and (b) supplying the country with currency.

Currency gets into circulation by being demanded against deposits at the paying tellers' windows of banks. Nowadays there is, by and large, only one way for a bank (even though it may do so indirectly through a correspondent) to satisfy this demand if it is persistently

greater than its deposits of currency. The bank must withdraw currency against a reserve credit at the Federal Reserve Bank. This, then, constitutes one use to which the member banks presumably put their acquisition of "additional reserve dollars" during the year under consideration. From the annual report of the Federal Reserve Board we find that the excess of such payments of currency over receipts for the year ended June 30, 1920, was $392,000,000, leaving $437,000,000 remaining from our figure of $829,000,000.

This $437,000,000 was the net amount of "additional reserve dollars" used by members to swell the "reservoir of banking reserves" and upon which their own increment of expansion was built during the year we are discussing.

The sharp distinction which should be drawn between these two uses of "additional reserve dollars" is the fact that in the one case the use of a reserve balance to secure cash to put in circulation involves a reduction of a bank's Federal Reserve balance by an amount exactly equal to the net amount of cash paid out to insistent depositors (assuming that till money remains constant); whereas in the second place the use of "additional reserve dollars" to augment the supply of Reserve Bank Credit in the credit reservoir is simply a precautionary measure depending on the amount of deposits created by the process of lending commercial bank credit, and, for the banks as a whole, bears no simple, direct, mathematical relationship to such increased lending. It is interesting to see that the $437,000,000 "additional reserve dollars" acquired by the member banks and not used for currency purposes bore a relationship of 1:4.65 to the increase of $2,026,000,000 in the deposits of all members during this period.[2] These computations may be summarized as follows:[3]

[2] From $22,807,000,000 on June 30, 1919, to $24,833,000,000 on June 30, 1920.

[3] One discussion of this question, which has received considerable attention, is contained in Vol. I, No. 5, of *The Chase Economic Bulletin*, entitled "The Gold and Rediscount Policy of the Federal Reserve Banks," by B. M. Anderson and A. Barton Hepburn. The following rather lengthy quotation from this excellent paper is interesting in view of the findings of our study:

"The theory has been heard in the course of the past year in certain circles that liquidation of Federal Reserve Bank earning assets will have to be slow, because an enormous liquidation of member bank loans must precede a moderate liquidation at the Federal Reserve Banks. The theory has been expressed that there is something like a 9:1 ratio between expansion of the banks of the country as a whole and the expansion of the Federal Reserve Banks, and that there must be consequently a liquidation of $9 of general bank credits to secure a liquidation of $1 at the Federal Reserve Banks. This theory apparently rests on the assumption that on every dollar of reserve bank credit there can be, will be, and has been based an expansion of $9 of credit in the country at large, and that there is a fixed ratio between reserve bank credit and general bank credit of about 9:1. The doctrine apparently is that credit will be expanded by every bank in the System to the full limit of the potentialities of the System, and that the one factor governing bank credit is the possible volume of reserves.

"An examination of the facts in this connection, as developed by our experience in the United States, is well worth while.

"We may take as our starting point April of 1917, at which time the total earning assets of the Federal Reserve Banks were approximately $220,000,000. Since that time the expansion in the earning assets of the Federal Reserve Banks has been enormous, and it is interesting to see what parallel movements there have been on the part of the banks of the country as a whole, and whether or not any definite ratios can be ascertained between them.

"Figures for the banks of the country as a whole are obtained annually in the reports made to the Comptroller toward the end of June. (For 1917 we have converted these figures into May 5 figures by altering them to conform to the national bank returns to the Comptroller on May 5—the Comptroller's "call" nearest to the beginning of Federal Reserve Bank expansion.) These figures cover national banks, state banks, trust companies, savings banks and private banks. We omit from them the figures for savings banks in our computations.

"If we compare the increased earning assets of the Federal Reserve Banks with the increase in commercial bank deposits in the country, we find that 15 months after the entrance of the United

From these computations it is clear that the expansion of member banks' deposits, on the basis of newly acquired reserves working at the greatest stress we have experienced during the recent period of strain, was at the rate of $4.65 of new deposits to $1.00 of new reserve. The relation of member banks to the Federal Reserve Banks is strictly primary, since there is no opportunity in it for granting credit based on a reserve which is in itself a credit based on a reserve (except in so far as a deposit at the Federal Reserve Bank is a credit based on a metallic reserve not equal to the deposit liability). If we start with a dollar of Federal Reserve credit and not with a dollar of Federal Reserve gold there is no possibility of credit pyramiding in this relation. In comparing the increase in the deposits of all the banks of the country, however, with the increase in the reserve dollars placed to the credit of *members* at the Federal

Footnote 3 continued from page 203:
States into the war, there had been a greater expansion of earning assets of the Federal Reserve Banks than there had been in the deposits of the commercial banks of the country. Instead of 9:1 expansion, the expansion had been 1:1.03. By the end of June, 1919, Federal Reserve Banks earning assets had expanded $2,128,000,000, while deposits in the commercial banks of the country had expanded $4,908,000,000, as compared with the situation of April, 1917. At the end of two years and three months, in other words, the ratio of expansion stood, not 9:1 but 2.8:1. By the end of June, 1920, at a time when the expansion of the banks of the country was straining every possible limit, the ratio had gone to 3.2:1. Federal Reserve Earning assets, by the end of June, 1920, had increased over April, 1917, $3,046,000,000, while deposits in the other banks of the country had increased $9,892,000,000. The comparison of bank deposits in the country with earning assets of the Federal Reserve Banks in the country gives no warrant to the view that there is any 9:1 ratio or that there is any fixed ratio. It does, however, demonstrate that the extreme limits of possible expansion of the banks of the country, based on Federal Reserve Bank expansion, are far below 9:1.

* * * *

"It is time to explode once for all the theory so widely prevalent in text-books, and so often used as a basis of wild computations, that a banker can expand his loans and deposits fourfold, sixfold or ninefold for every increase of reserves. It has often been gravely stated that for a given increase in the cash resources of a bank a seven-fold increase in its loans may be made; and since these loans will take the form of writing down deposit creditors to the customers' accounts in the books, a seven-fold increase in the bank's deposits may be made.

"The banker knows that this theory is absurd. He knows that he can only lend what he has. If new cash is deposited with him, or if through rediscounting he obtains new cash in the form of deposit credits with the Federal Reserve Bank, he can lend that. If he lends more than that he will find checks coming in against him at the clearing-house which it will embarrass him to meet, or checks presented at the counter, calling for actual cash. For a given bank at a given time loans can expand, not in any multiple ratio with increasing reserves, but merely dollar for dollar with increasing reserves.

"It is, of course, true that if all the banks of the country are simultaneously expanding so that they do not drain away one another's reserves, an expansion in a greater ratio than 1:1 may take place. If a bank could be sure that incoming checks at the clearing-house would always be offset by checks on another bank deposited with it, it could forthwith increase its loans (and consequently deposits) in some multiple ratio with the increase in its reserves obtained by rediscounting. But no bank can ever be sure of this. The figures given above would seem to indicate the maximum possibilities in this matter in the period of greatest stretching of credit that the country has ever seen. In quiet times we may expect that a ratio of 3.2:1 (the ratio of expansion of deposits of commercial banks to the expansion of the earning assets of the Federal Reserve Banks) will probably never be attained. For any individual bank to attempt to build $3.20 of credit upon $1 of rediscounts would be suicidal. For any particular section of the country to attempt it would be suicidal. For the country as a whole to attempt it when the rest of the world was quiescent in the matter of credit expansion would ordinarily be speedily checked by foreign drains on our gold. It was possible in 1919 and 1920 because not only the whole country, but also the whole world was straining every resource in credit expansion.

"Fundamentally the basis of credit is not reserves, but general assets. Credit may safely and properly grow as wealth grows, and particularly as the liquid part of wealth grows. * * * Even with the rediscount rates below the market rates, the member banks of the country are generally working hard to 'Get out of the Federal Reserve Banks,' that is, return to a position where their

Reserve Banks, we introduce the element of pyramiding credits inasmuch as many of the banks of the country look upon their balances with other banks, especially with member banks in New York City, as reserve balances. These balances, however, are themselves credits built upon balances at the Federal Reserve Banks. The extent of the pyramiding of credits in our banking structure is shown by the discrepancy between the ratios of 4.65:1 for the expansion of member banks' deposits to additional reserves and 7.9:1 for the expansion of the deposits of all commercial banks to additional reserves. From the table it will be seen that an increase of $1,454,000,000 in deposits was made possible because of the habit of pyramiding reserve credits outlined above.

We may also compute the ratio of expansion of reserves during the period between June, 1919, and June, 1920, to Loans and Discounts of the banks as a whole. For an increase in additional reserve dollars of $437,000,000, we find an increase of $5,373,000,000 in Loans and Discounts of all the banks—in the ratio of 12.3:1. The ratio for total Loans, Discounts and Investments of all the banks is 9.8:1, the increase in this total being $4,284,000,000.

III

The control of inflation by the Federal Reserve Banks (whether or not it be wise) functions by means of the use of the rediscount rate and the discretionary powers given the Reserve Banks in the matter of accepting certain kinds and amounts of paper for rediscount. This control, therefore, is leveled at the acquisition of "additional reserve dollars" by the member banks. Whether or not the discounting member bank is to use the newly acquired reserve balance for the purpose of withdrawing currency or for the purpose of supporting additional loans is generally not inquired into by the Federal Reserve Bank.

Because of the very prevalent use of the bank check as a medium of exchange in the United States, it is probably true (assuming no change in the velocity of turnover of bank deposits nor in the momentary habits of the people) that an increase in bank deposits has *as an effect,* though with some lag, an in-

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Footnote 3 continued from page 204:
own capital and surplus and deposits supply the basis of their earning and investing operations."

It is interesting to compare our ratio of 7.9:1 with that arrived at by Dr. Anderson of 3.2:1 for the same type of comparison. We have explained above in what ways our computations differ from his and for what reasons we have adopted them rather than those used by him. He suggests a condition, however, to which we would assent; namely, that expansion in such multiples as seem to have been the actual fact is possible only for a banking system as a whole—or as he puts it, even for the world as a whole. This is unquestionably true. It should also be remembered that the degree of expansion indicated by our figures occurred at a time when the whole world was indulging in an orgy of expansion such as has never been experienced before. One may safely say that nothing like a 7.9:1 expansion (even with the credit pyramiding possible in our system) would ordinarily occur. It was only under highly strained conditions that our reserve dollar became such a paragon of efficiency.

(In Millions)

	June, 1919	June, 1920	Increase
1. Rediscounts for Members	$1,818	$2,432	$ 614
2. Other Earning Assets	536	751	215
3. TOTAL	....	....	$ 829
4. Net Withdrawals of Cash	....	....	392
5. NET ADDITIONAL RESERVE DOLLARS	....	....	437
6. Deposits, All Member Banks	$22,807	$24,833	$2,026
7. Deposits, All Commercial Banks	31,542	35,002	3,460
RATIOS:			
Item 6 to item 5			4.65:1
Item 7 to item 5			7.9 :1

creased demand for currency. This demand amounts to from 10 to 20 cents in currency for every dollar of increase in deposits.[4]

In view of the primary position of rediscounting for the purpose of securing additional legal reserve against which commercial deposits may be built and the secondary position of rediscounting for the purpose of satisfying the public demand for currency, the present writer wishes to suggest that it would simplify the problem of controlling inflationary movements to recognize this distinction in the operation of the system instead of treating the two functions as one and the same thing.

It is beyond the scope of this paper and also the experience of the writer to go into the details whereby this distinction might be recognized. It would probably be extremely difficult, if not altogether impossible, to work it out in terms of the relationship between an individual bank and the Federal Reserve Bank. It seems clear, however, going back to our figures of expansion for the period between June, 1919, and June, 1920, that the emphasis of credit control on the part of the Federal Reserve Bank should be placed on the increase of borrowings represented by the $437,000,000 rather than upon the $392,000,000 representing net withdrawals of cash on the part of members. The banker has only a relatively small measure of control over the demands for cash at his windows; he *does* have a *far greater* measure of control over the demand for deposits in the form of loans of credit. It is toward the "additional reserve dollars" necessary to support such increased deposits that attention should be directed rather than toward the borrowing of members to supply the country with an increment of currency.[5]

[4] O. M. W. Sprague, "Discount Policy of the Federal Reserve Banks," *American Economic Review*, March, 1921.

[5] It is interesting to compute the corresponding ratios during the year of banking deflation which had its beginning between June, 1920, and June, 1921. As loans were liquidated at the banks, did they utilize the first funds to reduce their borrowings at the Federal Reserve Banks? In general, we know that they did, but it may be determined definitely at what rate this liquidation proceeded. In this case, also, the apparent reduction of liabilities of members at the Federal Reserve Banks is not an accurate measure of their surrender of reserve no longer necessary. It must be corrected.

The item of Rediscounts for Members on the Federal Reserve statement showed a reduction during the year from June, 1920, to June, 1921, from $2,432,000,000 to $1,771,000,000, or a total of $661,000,000. The Federal Reserve Banks, however, reduced their other earnings assets from $751,000,000 in June, 1920, to $289,000,000 in June, 1921. Presumably, therefore, if member banks and others had not had to pay $462,000,000 for these assets sold by the Reserve Banks, there would have been available for further reduction of borrowings of members this same amount, namely, $462,000,000. There were made, therefore, $1,123,000,000 of net payments to the Federal Reserve Banks during the year in question.

Currency and specie handled by the Federal Reserve Banks showed an excess of receipts over payments of $832,000,000, according to the Federal Reserve Board's Annual Report for 1921. Member banks, therefore, apparently used currency to the extent of $832,000,000 to apply on the payments of $1,123,000,000 which were required.

This leaves $291,000,000 as the net reduction of Reserve balances during the year. During the same period, the deposits of all members decreased by $2,096,000,000, or in a ratio of 7.2:1.

For the banks of the country as a whole this ratio was 8.6:1. The following table summarizes the calculation (000,000 omitted):

	June 30, 1920	June 30, 1921	Decrease
1. Rediscounts for Members	$ 2,432	$ 1,771	$ 661
2. Other Earning Assets	751	289	462
3. TOTAL	....	....	$1,123
4. *Less:* Net Receipts of Cash	....	....	832
5. NET	....	....	$ 291
6. Deposits All Members	$24,833	$22,737	$2,096
7. Deposits All Banks	35,002	32,504	2,498
Ratio Item 6 to Item 5			7.2:1
Ratio Item 7 to Item 5			8.6:1

THE WAGE BARGAIN AND THE MINIMUM WAGE DECISION

By FRANKLIN WINTON RYAN

JUST as there is a body of physical law, so there is a system of economic law. The engineer and the mechanic must acquaint themselves with physical laws in order to erect skyscrapers and construct submarines. Likewise the business man must master the laws of economics to solve his problems. The laws of business economics differ from the laws of physics and mechanics in that the former are usually stated as tendencies toward certain courses of action under certain conditions, while the latter are typically formulated as exact statements. The law of electro-magnets, or Archimedes' law of floating bodies, or the law of gravitation may be considered for practical purposes as absolute truths. A statutory enactment, for instance, could have no effect upon their operation. But economic laws are much more difficult to state and much less certain. They deal, not with universal forces as power, heat, light, magnetism, electricity and gravity, but with social tendencies depending upon the behavior of individual persons. A statutory enactment can have some effect upon such laws because a statute can change human behavior to a certain extent. But the statute does not nullify the economic law; it simply obstructs its operation.

There are certain economic laws which govern the making of a wage bargain. Society can set up rules in the form of statutes to govern such bargains but only up to a certain limit. If legislatures pass this limit, the statutes can operate only to obstruct and hinder the working out of the economic laws. So it comes to pass that any solutions of legal problems regarding wage bargains must recognize the fundamental principles of valuation agreements. Thus economics becomes a part of jurisprudence and the jurist becomes an economist.

The United States Supreme Court decided, in *Adkins v. Children's Hospital of the District of Columbia,* April 9, 1923, that a Minimum Wage Law for women and children is unconstitutional. Up to this time, minimum wage laws had been held to be constitutional by all the state supreme courts that had considered the question.[1] In this case the supreme court of the District of Columbia had rendered an adverse decision which was upheld when appeal was taken to the United States Supreme Court.

This decision seems to the writer not only to be correct but also to have unusual significance. In it the Court appears to have arrived at its solution of the problem by a resort to economic principles. It clearly recognizes that no statute can operate to nullify the economic laws of valuation as relating to the wage bargain. It brings out the seldom-recognized fact that within the bounds of jurisprudence is an inchoate evolving body of juristic economic theory apart from, but parallel to, the systems developed by the economists.

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[1] The authorities are collected in the majority opinion delivered by Mr. Justice Sutherland. See also T. R. Powell, "The Oregon Minimum-Wage Cases." 32 *Pol. Sci. Quarterly* 296.

The lower court had held that the minimum wage law of the District of Columbia was violative of that part of the Fourteenth Amendment to the United States Constitution, which reads:

> • • • nor shall any State deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws.[2]

It was argued that the right of Willie A. Lyons to contract her labor in any lawful calling is a property right of which, if the property right means anything, she cannot be deprived; that the constitution protects the freedom of contract with relation to one's business; that Congress may have power to require safeguards in conducting dangerous occupations that affect the mode of operation, but cannot provide how much the employer shall pay the employee for his services.

The United States Supreme Court upheld the decision that this particular Minimum Wage Law violates the constitutional guarantee of freedom of contract. The opinion distinguishes it from those other decisions upholding maximum hours of labor laws and other statutes limiting labor contracts which have been upheld. It is one thing to require that employees be paid in cash or every two weeks or that there shall be factory inspection or to say that excessive hours are detrimental to health and therefore may be forbidden. But it is quite another thing to say that the employee shall be prevented by law from making an ordinary business bargain as to the wages he shall receive during the period of time when work is permitted by law. The basis for the restriction of freedom of contract, in the case of statutes relating to the modes of payment and fixing of hours, is to be found in the police power of the state. It is well recognized that the state has power to protect its subjects against fraud and ill health.

It is the purpose of this paper to work out a somewhat more elaborate analysis of the wage bargain than was done in the decision to show that the Court, in recognizing this difference between the two sets of considerations in a wage valuation agreement, was setting forth, in a somewhat inarticulate way, a fundamental economic law.

Analysis of the Wage Bargain

There are six factors in the making of the wage bargain, namely, (1) the employer; (2) the employee; (3) the valuable things received by the employer; (4) the valuable things received by the employee; (5) the valuation process, or meeting of the minds in an agreement regarding the value of the two sets of things to be exchanged; (6) the rules which society has made to govern the making of contracts. These rules require in general that there must be competent parties, an offer and an acceptance, the things exchanged must have value, the object must be legal and there must be reality of consent. In addition to these general rules, certain other special rules have been set up from time to time by the different legislatures.

The chart on page 209 attempts to show briefly the complexity of a modern wage bargain. In the two parallel columns are listed some of the more important things in the two sets of considerations which are in the minds of the worker and the employer respectively when a wage agreement is made. The whole relation is not revealed in the pay envelope.

The wage bargain arises out of the

[2] Sec. 1, Art. XIV.

fact that the employer wants certain things which the worker can give him or can help him to get and that the worker wants certain things which the employer can give him or can help him to get. There will be a meeting of the two minds in a valuation agreement only when each is satisfied that the group of valuable things he expects to get is equal in value to the set of things he expects to give.

It would be impossible to list all the considerations in such an agreement.[3] The sets of considerations vary widely with different industries and occupations. Nevertheless we can say that in a typical wage bargain, the worker wants: (1) a fair day's pay for a fair day's work; (2) hours adjusted to health demands and need of leisure; (3) opportunities to take responsibility; (4) safety on the job; (5) wages at least equal to the wages of his fellow

[3] For a complete discussion of the entire set of considerations on the worker's side, read Whiting Williams, *What's on the Worker's Mind.*

Factors in the Making of a Wage Bargain

There are six factors in the making of a wage bargain:

1. The employer;
2. The employee;
3. The valuable things received by the employer;
4. The valuable things received by the employee;
5. The valuation process, or meeting of the minds in an agreement regarding the value of the two sets of things to be exchanged;
6. The rules which society has made to govern the making of contracts.

THE WAGE BARGAIN IS THE STRIKING OF A BALANCE BETWEEN THE TWO OPPOSING SETS OF CONSIDERATIONS

I WHAT THE WORKER WANTS	II WHAT THE EMPLOYER WANTS
1. A fair day's pay for a fair day's work;	1. A fair day's work for a fair day's pay;
2. Hours adjusted to health demands and need of leisure;	2. Greater product per man and higher quality of work;
3. Opportunities to take responsibility;	3. More responsible workers;
4. Safety on the job;	4. More careful workers;
5. If a superior worker, he wants a wage proportioned to production; if an inferior worker, he wants as good a wage as the majority of his fellow workers;	5. Scientific methods of wage payment based upon what each worker actually produces;
6. Certainty of employment;	6. Certainty that the product will be sold;
7. Minimum lay-offs;	7. Low labor turnover;
8. Work which does not fatigue;	8. Strong, efficient workers;
9. Work that he enjoys, work that he can do well;	9. Workers' interest in the business;
10. Recognition of good work done;	10. Industrial good-will;
11. Promotion according to good work and length of service;	11. Wants the men he has developed to be loyal and stay in the business;
12. Protection against unjust discharge;	12. Protection against unjust demands of workers;
13. Good health conditions;	13. Smooth running organization;
14. Sympathetic understanding by the employer and his representatives;	14. Good discipline;
15. Wants a chance to advance in efficiency, to become a more valuable worker, to make good on the job, to become more and more respected as a useful citizen.	15. Wants the business to grow, to be prosperous, to become widely known, to become of greater service to society.

workers; (6) certainty of employment; (7) minimum lay-offs; (8) work which does not fatigue; (9) work that he likes to do; (10) recognition of good work done; (11) promotion according to good work and length of service; (12) protection against unjust discharge; (13) good health conditions; (14) sympathetic understanding by the employer and his representatives; (15) a chance to advance in efficiency, to become a more valuable worker, to make good on the job, to become more and more respected as a useful citizen. He also wants to save for old age and provide for his family. His whole life is wrapped up in his job.

On the other hand, the employer's set of considerations is somewhat similar. Some of the things which he wants are: (1) a fair day's work for a fair day's pay; (2) greater product per man and higher quality of work; (3) more responsible workers; (4) more careful workers; (5) wages based upon what each man is actually producing; (6) certainty that the product will be sold; (7) low labor turnover; (8) strong, efficient workers; (9) workers' interest in the business; (10) industrial good-will; (11) continued loyalty of the workers; (12) protection against unjust demands of the workers; (13) smoothly running organization; (14) good discipline; (15) progress in building up the business and in widening its sphere of usefulness to society. His life also is wrapped up in his work.

The Court seemed to be saying that in the making of wage bargains, there are two different fields of thought, namely, (1) considerations in regard to the things exchanged, such as hours, labor conditions, safety, certainty of employment, interest in the work, health conditions, personal associations, the future in the work, methods of wage payment, and so forth, and (2) striking a valuation agreement in regard to the two groups of things exchanged. It would appear as though the Court were setting up a rule that the exercise of the police power of the state does not interfere with the doctrine of freedom of contract when it seeks to regulate the details of the things to be exchanged in a wage bargain but that it does interfere with that doctrine when it attempts to fix minimum wages because the wage agreement is the meeting of the minds itself, or the place where the inequalities between the things to be exchanged are equalized. The Court evidently felt that if the doctrine of freedom of contract is to be preserved, there must be a zone of considerations, namely, considerations of valuation, left free from statutory interference.[4]

This theory appears to be expressed in the following passages from the decision:

> There is, of course, no such thing as absolute freedom of contract. It is subject to a great variety of restraints. * * * It will be helpful * * * to review some of the decisions where the interference has been upheld and consider the grounds upon which they rest:
>
> (1) Those dealing with statutes fixing rates and charges to be exacted by businesses impressed with a public interest. * * * In the case at bar the statute does not depend upon the existence of a public interest in any business to be affected, and this class of cases may be laid aside as inapplicable.
>
> (2) Statutes relating to contracts for the performance of public work. * * * We may * * * in like manner dismiss these decisions from consideration as inapplicable.
>
> (3) Statutes prescribing the character,

[4] This economic doctrine seems to be implied in the final paragraphs of Samuel Williston, "Freedom of Contract," 6, *Cornell Law Quarterly*, 379-380.

methods and time for payment of wages. * * * In none of the statutes thus sustained was the liberty of the employer or employee to fix the amount of wages the one was willing to pay and the other was willing to receive interfered with. * * * in no sense can they be said to be, or to furnish a precedent for, wage-fixing statutes.

(4) Statutes fixing hours of labor. * * * In *Holden v. Hardy,* 169 U. S. 366, * * * This statute was sustained as a legitimate exercise of the police power. * * * In *Bunting v. Oregon,* 243 U. S. 426, a state statute forbidding the employment of any person in any mill, factory or manufacturing establishment more than ten hours in any one day, and providing payment for overtime not exceeding three hours in any one day at the rate of time and a half of the regular wage, was sustained on the ground that, since the State Legislature and State Supreme Court had found such a law necessary for the preservation of the health of employees in these industries, this court would accept their judgment in the absence of facts to support the contrary conclusion. The law was attacked on the ground that it constituted an attempt to fix wages, but that contention was rejected and the law sustained as a reasonable regulation of hours of service. * * * In the Muller case (*Muller v. Oregon,* 208 U. S. 412) the validity of an Oregon statute, forbidding the employment of any female in certain industries more than ten hours during any one day was upheld.

The essential characteristics of the statute now under consideration, which differentiate it from the laws fixing hours of labor, will be made to appear as we proceed. It is sufficient now to point out that the latter [hours of labor statutes] as well as the statutes mentioned under paragraph (3) [statutes specifying character of work, methods, and times of payment], deal with the incidents of the employment having no necessary effect upon the heart of the contract, that is, the amount of wages to be paid and received.

A law forbidding work to continue beyond a certain number of hours leaves the parties free to contract about wages and thereby equalize whatever additional burdens may be imposed upon the employer as a result of the restrictions as to hours, by an adjustment in respect of the amount of wages.

* * * * * * * * * * *

If now, * * * we examine and analyze the statute in question, we shall see that it differs from them [the four types of statutes held to be constitutional] in every material respect. * * * It has nothing to do with the character, methods or periods of wage payments. It does not prescribe hours of labor or conditions under which labor is to be done.

* * * * * * * * * * *

It is simply and exclusively a price-fixing law, confined to adult women (for we are not now considering the provisions relating to minors), who are legally as capable of contracting for themselves as men. It forbids two parties having equal capacity—under penalties as to the employer—to freely contract with one another in respect to the price for which one shall render service to the other in a purely private employment where both are willing, perhaps anxious, to agree, even though the consequence may be to oblige one to surrender a desirable engagement and the other to dispense with the services of a desirable employee.

The Minimum Wage Law of the District of Columbia whose constitutionality was being called into question, was a statute giving power to a board

> to ascertain and declare in the manner hereinafter provided * * * standards of minimum wages for women in any occupation * * * and what wages are adequate to supply the necessary cost of living to any such women workers to maintain them in good health and to protect their morals.

On these points the Court said:

> What is sufficient to supply the necessary cost of living for a woman worker and maintain her in good health and protect her morals is obviously not a precise and unvarying sum—not even approximately so. The amount will depend upon a variety of circumstances. * * *

> To those who practice economy, a given sum will afford comfort, while to those of a contrary habit the same sum will be wholly inadequate. The cooperative economies of the family group are not taken into account.
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> * * * * * * * * * * *
>
> The relation between earnings and morals is not capable of standardization. It cannot be shown that highly paid women safeguard their morals more carefully than those who are poorly paid.

The Court also significantly points out:

> No distinction can be made between women who work for others and those who do not.

This is saying in reality that if a statute can establish a minimum price at which a person can sell her services and at which the purchaser can buy such services in the employer-employee relation, it may just as well be applied where a person sells labor and services embodied in some tangible product as in such cases as those of a dressmaker, or a tailor, or a caterer. The minimum wage law is simply a sumptuary law.

The Court cited some of the orders of the Commission operating under the law to illustrate the difficulty of establishing a practical minimum wage upon any basis of fact.

> This uncertainty of the statutory standard is demonstrated by a consideration of certain orders of the board already made. These orders fix the sum to be paid to a woman employed in a place where food is served or in a mercantile establishment at $16.50 per week; in a printing establishment, at $15.50 per week; and in a laundry at $15 per week, with a provision reducing this to $9 in the case of a beginner. If a woman employed to serve food requires a minimum of $16.50 per week, it is hard to understand how the same woman working in a printing establishment or in a laundry is to get on with an income lessened by from $1 to $7.50 per week. The board probably found it impossible to follow the indefinite standard of the statute and brought other and different factors into the problem; and this goes far in the direction of demonstrating the fatal uncertainty of the act, an infirmity which, in our opinion, plainly exists.

The opinion states further:

> The law takes account of the necessities of only one party to the contract. It ignores the necessities of the employer by compelling him to pay not less than a certain sum, not only whether the employee is capable of earning it, but irrespective of the ability of the business to sustain the burden, generously leaving him, of course, the privilege of abandoning his business as an alternative for going on at a loss. Within the limits of the minimum sum, he is precluded, under penalty of fine and imprisonment, from adjusting compensation to the different merits of his employees. It compels him to pay at least the sum fixed in any event, because the employee needs it, but requires no service of equivalent value from the employee.
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> To the extent that the sum fixed exceeds the fair value of the services rendered, it amounts to a compulsory exaction from the employer for the support of a partially indigent person, for whose condition there rests upon him no peculiar responsibility, and therefore, in effect, arbitrarily shifts to his shoulders a burden which, if it belongs to anybody, belongs to society as a whole.

Notice this very significant passage from the opinion:

> The feature of this statute which, perhaps more than any other, puts upon it the stamp of invalidity is that it exacts from the employer an arbitrary payment for a purpose and upon a basis having no causal connection with his business, or the contract or the work the employee engages to do. * * *
>
> The moral requirement implicit in every contract of employment, viz., that the amount to be paid and the service to be rendered shall bear to each other some relation of just equivalence is completely

> ignored. * * * A statute which prescribes payment * * * solely with relation to circumstances apart from the contract of employment, the business affected by it and the work done under it, is so clearly the product of a naked arbitrary exercise of power that it cannot be allowed to stand under the Constitution of the United States.

In answer to the argument that great benefits have resulted from the operation of such statutes, not alone in the District of Columbia, but in several states where they have been in force, the opinion says:

> We cannot close our eyes to the notorious fact that earnings everywhere in all occupations have greatly increased —not alone in states where the minimum wage law obtains but in the country generally—quite as much or more among men as among women and in occupations outside the reach of the law as in those governed by it. No real test of the economic value of the law can be had during periods of maximum employment, when general causes keep wages up to or above the minimum; that will come in periods of depression and struggle for employment when the efficient will be employed at the minimum rate while the less capable may not be employed at all.

Finally the Court pointed out the inevitable corollary of the power to fix a minimum wage which is the power to fix a maximum wage:

> Finally, it may be said that if, in the interest of the public welfare, the police power may be invoked to justify the fixing of a minimum wage, it may, when the public welfare is thought to require it, be invoked to justify a maximum wage. The power to fix high wages connotes, by like course of reasoning, the power to fix low wages. * * * If, for example, in the opinion of future lawmakers, wages in the building trades shall become so high as to preclude people of ordinary means from building and owning homes, an authority which sustains the minimum wages will be invoked to support a maximum wage for building laborers and artisans, and the same argument which has been here urged to strip the employer of his constitutional liberty of contract in one direction will be utilized to strip the employee of his constitutional liberty of contract in the opposite direction. A wrong decision does not end with itself; it is a precedent, and, with the swing of sentiment, its bad influence may run from one extremity of the arc to the other.

Thus, the Supreme Court of the United States was forced to the economic solution which is the ultimate one. The answer to the question of what is meant by equal protection of the laws is found in the economics of value and the principles of the distribution of wealth. The word *equal* here implies comparisons in value. The answer to the question of what is meant by freedom of contract is ultimately an economic answer. The meeting of the minds in the offer and acceptance implies valuation. The subject-matter of a contract is something of value and the consideration is a valuable consideration. The execution or the breach of a contract is in terms of value and valuable things. When the Court in discussing the Minimum Wage Law emphasized the point that the moral requirement in every contract is that the amount to be paid and the service to be rendered shall bear to each other some relation of just equivalence, economic reasoning was being used. These five justices who concurred in the opinion saw plainly that resort to legal precedent could not accomplish much in this problem.

The reasoning is clear. The five justices realized that it is uneconomic to attempt to determine wages upon the basis of a standard of living. They apparently felt that a sumptuary law is a violation of economic principles and that the theory of the Minimum Wage Law if carried out to its full extent

would result in a restriction of the constitutional guarantee of freedom of contract.[5]

The case reveals a phase of the conflict between socialism and individualism. Socialism would pay each member of society what he needs regardless of what his services are worth. Individualism pays each worker what his services are worth as a result, on the one hand, of what the worker is willing to take, and, on the other hand, of what the employer is willing to give in view of the anticipated market price of the things to be created by the services of the worker. The first theory, if put into complete operation, would result in state pensions for the idle. The second theory encourages individual initiative and results in increased production. It tends to eliminate the unfit and inefficient.

Chief Justice Taft did not agree with the opinion of the Court. In his dissenting opinion he objects to the application of economic reasoning to determine a boundary line beyond which the exercise of the police power of the state becomes an invasion of the guarantee of liberty under the Fifth and Fourteenth Amendments. Although he admitted that the problem involved economic issues, he maintained:

> But it is not the function of this Court to hold congressional acts invalid simply because they are passed to carry out economic views which the Court believes to be unwise or unsound.

He cites a line of cases upholding laws of the type that limit hours of work and standardize working conditions to prove that a Minimum Wage Law should be held constitutional. In answer to the Court's distinction between the two classes of statutes, he says:

> I regret to be at variance with the Court as to the substance of this distinction. * * * I do not feel * * * that either on the basis of reasoning, experience or authority, the boundary of the police power should be drawn to include maximum hours and exclude a minimum wage. * * * In absolute freedom of contract the one term is as important as the other, for both enter equally into the consideration given and received, a restriction as to one is not any greater in essence than the other, and is of the same kind. One is the multiplier and the other the multiplicand. * * * With deference to the very able opinion of the Court and my brethren who concur in it, it appears to me to exaggerate the importance of the wage term of the contract of employment as more inviolate than its other terms. Its conclusion seems influenced by the fear that the concession of the power to impose a minimum wage must carry with it a concession of the power to fix a maximum wage.

We might grant Chief Justice Taft's argument that to declare a Minimum Wage Law constitutional would not necessarily carry with it the power to fix a maximum wage and yet find that much of the remaining reasoning is in conflict with economic laws. It appears that his contentions lose much of their force because of the following points:

1. He objects to the use of economic reasoning to work out the economic problem of the point at which the exercise of the state's police power interferes with the freedom of contract.

2. In his arguments he is not greatly concerned with the very important point upon which the Court's decision seems to be based, namely, that the Minimum Wage Law of the District of Columbia interfered with the meeting of the minds in a labor valuation agreement by ex-

[5] On the doctrine of Freedom of Contract and its development, see Pound, "Liberty of Contract," 18, *Yale Law Journal*, 454; reprinted in part in Wigmore *et al*, *Rational Basis of Legal Institutions*, 1923, p. 124.

acting from the employer an arbitrary payment for a purpose and upon a basis having no causal connection with this business or the contract or the work the employee engages to do.

3. He refuses to recognize the two different zones of thought in the making of a wage bargain and that while hours, labor conditions, safety devices, and so forth, are mere details of the things to be exchanged, the meeting of the minds in the process of valuation is the contract itself.

4. He is more interested in carefully examining past decisions of the courts to find his solution than he is in facing the economic issue as it really is. By the justices of the majority opinion, economic principles were given equal weight with principles of jurisprudence. It ought to be clearly seen that where legal theory conflicts with economic laws, the economic laws must inevitably prevail.

5. A sale of something produced by labor is not very different from the sale of the labor itself, except that in the latter case the worker must go to the place where he sells his labor. When a person markets his own product the two become practically the same. Yet it has been impossible in the past to fix prices of commodities by statute except for emergency periods.

6. The freedom of the meeting of the minds in a valuation agreement in regard to the things exchanged in a contract, which is guaranteed under the Constitution, can be surrendered by workers who desire to do so, in a perfectly economic way, by joining labor unions and applying the recognized principle of collective bargaining. Furthermore, we have seen that the labor union, where its wage rates have been set above those fixed by governmental boards, will not hesitate to ignore the governmental rate and attempt to use its economic power to enforce its demands. The principle of the Minimum Wage Law might even go so far as to interfere with the freedom of contract now enjoyed by the labor union itself.

Up to this point it has not appeared that there is any serious weakness in the decision. But we have yet to note a few points set forth by Justice Holmes who also dissented from the opinion of the Supreme Court. He said in part:

> The question in this case is the broad one, whether Congress can establish minimum wages for women in the District of Columbia with due provision for special circumstances, or whether we must say that Congress has no power to meddle with the matter at all. To me * * * the power of Congress seems absolutely free from doubt. * * * I agree, of course, that a law answering the foregoing requirements might be invalidated by specific provisions of the Constitution. For instance, it might take private property without just compensation. But in the present instance the only objection that can be urged is found within the vague contours of the Fifth Amendment, prohibiting the depriving any person of liberty or property without due process of law. * * *
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> The earlier decisions upon the same words in the Fourteenth Amendment began within our memory and went no further than an unpretentious assertion of the liberty to follow ordinary callings. Later that innocuous generality was expanded into the dogma Liberty of Contract. Contract is not specifically mentioned in the text we have to construe.

Justice Holmes then cites several cases where other restrictive laws and rulings have been upheld that seem to him to have interfered with liberty of contract quite as seriously as the Minimum Wage Law. Most of these cases which he cites do not involve the valuation process in the meeting of the minds

in a contract, but there is one statute that does this. This is the usury law.

He also objects, in a line of reasoning similar to that presented by Chief Justice Taft, to the line of demarcation set by the Court between wages and hours in the wage contract. He says:

> * * * I perceive no difference in the kind or degree of interference with liberty, the only matter with which we have any concern, between the one case and the other. The bargain is equally affected whichever half you regulate.

But wages and hours are not the two halves of a wage bargain. Here he overlooks the economic distinction that when a statute seeks to regulate hours it is regulating only one of the details of the things to be exchanged and that when a law seeks to regulate price, it interferes with the valuation process itself.

He continues:

> This statute does not compel anybody to pay anything. It simply forbids employment at rates below those fixed as the minimum requirement of health and right living. It is safe to assume that women will not be employed at even the lowest wages unless they earn them or unless the employer's business can sustain the burden.

This is what actually happened. Willie A. Lyons lost her position because of the Minimum Wage Law and a man was employed to take her place at a lower wage because the law did not apply to the employment of men.

Finally Justice Holmes points out that although the criterion of constitutionality is not whether we believe the law is for the public good or not, yet the minimum wage legislation of Great Britain, Victoria, and some of the American states has apparently been based upon such a belief. He mentions a large collection of documents, in the possession of the Court, submitted to show that such a belief may be reasonably held. He then remarks that if a legislature should adopt the opinion that "freedom of contract is a misnomer as applied to a contract between an employer and an ordinary individual employee," and the opinion that industrial peace was best attained by a tribunal for fixing minimum wages in industrial disputes, he could not contradict such opinions or deny that the end to be attained justified restrictive legislation quite as adequately as beliefs concerning Sunday or theories about usury.

In other words, when he cites the usury laws he seems to be saying that if usury laws are constitutional, the Minimum Wage Law should be held constitutional, because it interferes with the valuation process in a similar way to that in which a usury law interferes in a loan contract.

It seems to the writer that the entire issue narrows down to this point. If it is true, as Justice Holmes appears to contend, that the theory of a usury law is the same as the theory of the Minimum Wage Law of the District of Columbia, then, since usury laws are constitutional,[6] it should follow that such a minimum wage law is constitutional.

During the progress of the Minimum Wage case a brief was presented to the Supreme Court [7] setting forth the argu-

[6] The constitutionality of usury laws is well settled. See *Otis v. Parker*, 187 U. S. 606; *Pollak v. Farmers Loan and Trust Company*, 158 U. S. 601, 627; *Flint River Steamboat Co. v. Foster*, 5 Ga. 194; *Byers v. Commonwealth*, 42 Pa. 89; *Griffith v. Conn*, 218 U. S. 563; *Engel v. O'Malley*, 219 U. S. 128; *State v. Sherman*, 18 Wyo. 169, 105 Pac. 299; *Calhoun Co. Sup. v. Galbraith*, 99 U S. 214.

[7] Supreme Court of the United States, No. 795, *Adkins v. Children's Hospital of the District of Columbia*, Supplemental Brief of Amici Curiae, Fred M. Wilcox, Chairman Industrial Commission of Wisconsin.

ment that the position taken by the lower court was fundamentally wrong if the provisions and the doctrines of the state usury laws are correct. The brief declares that every argument advanced by the decision of the trial court against the legality of the Minimum Wage Law is equally applicable to the usury law.

Now the two theories may be the same in jurisprudence; they certainly are not the same in economics. Moreover the final solution of this question must be an economic solution. A usury law interferes with the meeting of the minds in a loan bargain from an entirely different theory from the theory of the Minimum Wage Law of the District of Columbia which proceeds upon the notion that the employer must pay a so-called living wage regardless of what the services of the worker are worth. The theory of a usury law is that where one of the parties to a loan contract is in such a necessitous condition that he can be easily taken advantage of, or if the free interplay of economic forces has been hindered in a way that can be remedied, then government is justified in taking measures to put the two parties upon more equal bargaining positions by price-fixing.[8] In other words, the theory of the usury law is that it attempts to change the conditions in a loan bargain in order to promote greater freedom of contract, while the Minimum Wage Law in question aimed to restrict the situation and force the employer to pay a so-called living wage. The two theories are incompatible.

It is not material to this problem to object that the old usury laws do not work, that they do more harm than good, that they violate economic principles in their operation and that they are a dead letter. It is true that these old general blanket statutory maximums actually operated in the majority of cases to obstruct and hinder the free interplay of economic forces. But the theory of the usury laws is sound economics.[9] Jeremy Bentham[10] never proved that the theory was wrong; he merely showed that the laws did not effectively carry out the theory and that they were powerless to control the market rate of pure interest on business loans. We are just now beginning to find out how to put this theory into practical operation. Some 20 states have enacted the Uniform Small Loan Law which is a really effective instrument for putting into practice the original theory of the usury laws. In every state where it has been properly set up, it has met with remarkable success in eliminating the loan shark evil, thus finally attaining after many generations what the original framers of the usury laws intended they should accomplish.[11]

Conclusion

Upon the basis of the foregoing considerations, it seems to the writer that the recent Minimum Wage Law decision, by a final resort to economic prin-

[8] *McArthur v. Schenck*, 31 Wis. 673, p. 676; *Chapman v. State*, 5 Oreg. 432; *State v. Griffith*, 83 Conn. 1, 74 Atl. 1068; *Southern L. Ins. v. Packer*, 17 N. Y. 51, 53.

[9] The economic theory of usury laws is admirably set forth in Alfred Marshall, *Principles of Economics*, 8th Ed. Bk. VI, ch. vi, p. 584; F. W. Taussig, *Principles of Economics*, Vol. II, ch. xl, p. 35; C. J. Bullock, *Introduction to the Study of Economics*, p. 435; Irving Fisher, *Elementary Principles of Economics*, pp. 394-396.

[10] Bentham's position was set forth in his *Letters in Defense of Usury*, 1787.

[11] On the progress made in eliminating the loan shark evil by the Uniform Small Loan Law, see the bulletins of the Legal Reform Bureau, 135 Broadway, New York City; and the reports of the Russell Sage Foundation, 130 E. 22nd St., New York City.

ciples, inarticulately sets forth the following rules:

1. There must be no interference by the police power of a state, with the freedom of contract, that is, with the free meeting of the minds of the parties in making a valuation agreement regarding the things to be exchanged.

2. If the parties are upon a reasonably equal footing as to relative power to bargain, this rule is free from qualification, but:

3. The framers of the Constitution and the framers of the Fifth and Fourteenth Amendments, out of which grew the doctrine of freedom of contract, knew of the abridgment [12] of the right of freedom of contract which is embodied in the theory of the usury laws, namely, that where one of the parties to a loan contract is in such a necessitous situation that he can be easily taken advantage of, or if the free interplay of economic forces has been hindered in a way that can be remedied, then the Government is justified in providing a remedy by price fixing.

(The following rule seems to be the one upon which the Minimum Wage Law was declared unconstitutional. Right here is shown the basic difference between the Minimum Wage Law of the District of Columbia and the usury laws.)

4. But the price fixing must not be on the basis of the needs of the parties. It must be an attempt to find out what would be the true price if the parties were upon equal bargaining positions and if there were reasonably free interplay of economic forces of supply and demand to determine the price in the market.

In the light of these formulations it would then appear that if in the future, a minimum wage law should come up to be tried for constitutionality, which law is administered by a tribunal or board which attempts to set minimum wages, not on the basis of needs or standards of living, but upon the basis of what would be fair as compared with wages in other lines of work and also with wages in the same line of work and in accordance with the foregoing principle, it might be declared, by economic reasoning, to be in harmony with the doctrine of Freedom of Contract.

[12] *Pollak v. Farmers Loan and Trust Co.*, 158 U. S. 601, 627, and cases in footnote 6 above. I am indebted to Mr. Reginald H. Smith, of the Boston Bar, for suggesting this point.

DETERMINATION OF NET EARNINGS AVAILABLE FOR BOND INTEREST

By PERCY W. BROWN

A CUSTOM has come to prevail to some extent in investment banking circles which may be open to more or less criticism from people of conservative opinions. I allude to the habit of making statements in bond circulars to the effect that net earnings before deducting depreciation charges and before deducting taxes were so much, a sum equivalent to two, two and one-half, or three (as the case may be) times the interest requirements of the bonds. Since many learned pages and even volumes have been written on the subject, it is not the purpose of this short article to discuss the various theories of depreciation, but I should like to offer my comment on this custom.

Deduction of Depreciation

The methods of allowing for depreciation usually fall into one of the following groups:

1. Straight-line depreciation, which is a fixed percentage of the original cost, to be charged off each accounting period
2. A percentage of the diminishing value
3. Offsetting depreciation by improvements and maintenance expenditures

Which method is the most nearly scientific as applied to public utilities and industrial plants is open to debate. But that some method of computing depreciation on these industries is necessary is not open to debate. All tangible property, with the possible exception of land, is subject to wear and tear and to some degree to obsolescence and inadequacy. The life of most machinery varies from five to twenty years; repairs may be made frequently, but they serve only to prolong the life and not to renew it. The Supreme Court of Oklahoma said: "It is rare that any physical property impaired by time and use can be so repaired as to be the equivalent of the same property new. There comes a time in the life of physical units when they cannot be made usable by repair, and they must be discarded and replaced by new properties, which requires the expenditure of capital." Of course, repairs should be distinguished from renewals and replacements, which are capital expenditures and usually should be so treated. Now repairs vary materially. As the efficiency of the property declines with age, the annual repair bill increases, with the result that the annual charge to operating expenses increases and profits decrease.

The horse affords a good example of pure depreciation. The repairs are negligible—new shoes now and then—and all expenses necessary for his upkeep are operating expenses—feed, shelter, and care; yet the horse has a limited life and must be renewed. When a large number of horses is employed, the average age can be predetermined with a fair degree of accuracy, and this prospect of renewal must be calculated by some method, if we would avoid the unpleasant consequences of having all the horses die at approximately the same time and having no funds with which to purchase a new supply.

Depreciation may not be visible for several years, but it is hourly at work like the tree borer, gradually but steadily reducing the efficiency of the plant. An executive of a large cotton mill once told me that he considered it unnecessary to make any charge-off during the first two years of the life of new looms. On the other hand, it is manifest that the same looms will depreciate very rapidly during the last two years of their life. You cannot escape it, therefore, even for a brief period.

What Is Vital to the Investor?

Now the prospective investor is not interested in fine-spun theories of varying rates of depreciation, for he wishes to have an accurate estimate of the earning power behind his investment security, which can be obtained only by showing the exact amount of the actual net income and its divisible ratio to the interest charge. If he is shown an inaccurate income statement, he will get an exaggerated picture of this earning power. The straight-line method which, because of its simplicity, is most often used, makes adequate charges to provide for depreciation, and therefore affords a fair criterion of the earning power of a corporation, the securities of which are held by the public.

Enthusiastic bond salesmen, when accosted with this matter of showing net earnings before depreciation as being available for interest charges, generally group their arguments somewhat as follows:

First, these salesmen say that additions and improvements constantly being made are sufficient to offset depreciation, to which the answer is that all actual additions should be charged to capital account and a fair amount charged to operating expense to represent the value of any property abandoned. In short, we cannot say offhand that the property is well maintained and in a high state of efficiency and that therefore no depreciation charges are necessary.

Secondly, they say that interest charges must be paid while depreciation charges can be deferred, as the latter are not an immediate charge against the working capital of the corporation. This argument is specious, but it entirely overlooks the point at issue—earning power. We are not directly interested in the cash requirements from month to month, provided they are adequate to meet the needs of the business. What we are vitally concerned with is the position in which the corporation will find itself when its bonds mature, say, twenty years hence. Suppose a corporation starts with new machinery all of which has a life of twenty years and suppose at the same time that the corporation earns each year just enough to cover all expenses, including repairs but not depreciation, and shows a balance exactly equal to the bond interest requirements. At once it becomes obvious that at the end of the twenty-year period the machinery will have become completely worn out and there will be no funds with which to replace it. Hence, to continue operations the corporation will be obliged to seek additional capital in order to purchase the needed machinery.

What Operating Expenses Include

Professor H. E. Riggs, of the University of Michigan, in a small volume on "Depreciation of Public Utility Properties" written from the standpoint of the layman, strongly contends that "the cost of replacement of property is an operating expense, and has been un-

equivocally recognized as such by the Supreme Court." He goes further and states that "it would seem that the surest way to secure anything approximating reasonably correct accounting for replacement would be to treat the entire cost of the replacement as an operating expense and not to complicate the bookkeeping by attempting to charge to capital any part of the excess cost of the new thing over the thing it replaces," on the theory that the original investment was in property and that property and not original cost is that which must be maintained. The replacement of an 80-pound rail by a 120-pound rail gives greater capacity and the extra 40 pounds would seem to be an addition to the capital investment quite different in character from the replacement of an old tie costing 40 cents originally with a new tie costing over a dollar. Professor Riggs states this clearly elsewhere—"Any replacement of property units used in operation, be the units large or small, which does not change the character of the property, or increase its size or capacity, is an operating expense."

The City of New Orleans has an agreement with the public service corporation which operates the electric power and light properties, gas manufacturing, and street railway systems to the effect that the city agrees to permit such rates for the various services as will enable the company to earn 7½% return on values as determined from time to time, after operating expenses, taxes, and reserve for renewals and replacements have been deducted. The definition of depreciation reserve, in this instance, could hardly be better expressed than the last clause, "reserve for renewals and replacements." And the city authorities recognize this reserve as one of the legitimate operating expenses.

The Knoxville Water Case

The language of the U. S. Supreme Court in the famous Knoxville Water Company case is so clear and concise that a portion of the decision may well be given here: "A water plant with all its additions begins to depreciate in value from the moment of its use. Before coming to the question of profit at all, the company is entitled to earn a sufficient sum annually to provide not only for current repairs, but for making good the depreciation and replacing the parts of the property when they come to the end of their life. The company is not bound to see its property gradually waste, without making provision out of earnings for its replacement. It is entitled to see that from earnings the value of the property invested is kept unimpaired, so that, at the end of any given term of years, the original investment remains as it was at the beginning. It is not only the right of the company to make such a provision, but it is its duty to its bond- and stockholders, and, in the case of a public service corporation at least, its plain duty to the public. If a different course were pursued, the only method of providing for replacement of property which had ceased to be useful would be the investment of new capital and the issue of new bonds or stocks. This course would lead to a constantly increasing variance between present value and bond and stock capitalization—a tendency which would inevitably lead to disaster either to the stockholders or to the public, or both. If, however, a company fails to perform this plain duty and to exact sufficient returns to keep the investment unimpaired, whether this is the result of unwarranted dividends upon overissues of securities, or of omission to exact proper prices for the output, the fault is its own.

When, therefore, a public regulation of its prices comes under question, the true value of the property then employed for the purpose of earning a return can not be enhanced by a consideration of the errors in management which have been committed in the past."

Arthur Lowes Dickinson, a distinguished accountant, says, "In order to insure a correct statement of the earnings and position of any business, it is essential, either that its property should be fully maintained at the same standard as at the date of acquisition, or that proper provision should be made for any falling-off from that standard . . . the provisions necessary either to maintain the property values, or to compensate for any falling-off from the original standard, consist of repairs, renewals, and depreciation, the latter including both that due to wear and to tear and that due to obsolescence."

Expenditures made on the plant should be divided equitably, so that a proper amount may be charged to capital account to represent the additions and betterments, and a proper amount may be charged to the income account to represent ordinary repairs and minor replacements which recur at frequent intervals; that is to say, current periodical expenditures on the general upkeep and not the renewal of any substantial part of the plant or machinery. If this is done—and it should be done if we would have a true picture of the business—then no loose statement can be put out that improvements and betterments offset any depreciation. Improvements and betterments are distinctly a capital charge, and he who would say otherwise muddies the waters. Carrying this improper theory to its limit, we would arrive at the situation described above, where all the horses die at the same time, and there are no funds reserved from profits with which to purchase a new supply.

Deduction of Federal Taxes

It has also become somewhat of a custom for investment firms to apply bond-interest requirements to corporate earnings before deducting Federal Income Taxes. They are willing to consider as operating expenses all other kinds of taxes—franchise, state and local—but they separate the Federal Income Tax as a deduction to follow rather than to precede the interest charge.

I suppose that this arises from two lines of argument: first, that the Treasury Department applies the tax to net profits after all proper deductions, including interest paid; and secondly, that income taxes are at best an estimate, because they are not accurately ascertainable as are other current liabilities.

Now, the Treasury Department method of computing the tax is just that —a method. The test comes in the relativity of the tax to the claims of creditors. How "close to the rails" is the claim of the Government?

Under the Income Tax rulings (Cumulative Bulletin for December, 1920, page 308) it is clearly stated that the Government has the right, under section 3466 R. S., to receive payment of income and profits taxes from a receiver in preference to the creditors of the corporation. Thus, it is erroneous reasoning to argue that Federal taxes are anything but a prior claim over bond interest.

The other contention is equally futile —that taxes are but an estimated reserve, because usually they are unascertainable. It is good accounting always to make provision for every known liability, even when the exact amount is

not known. It is always possible to make an approximate estimate, and while it may be set up under the heading of reserves, instead of under current liabilities, nevertheless it should always be included with current liabilities in gaging the liquid condition of a corporation, for it is a liability due within twelve months.

I have heard the excuse made for these practices that "other houses do it," and that the custom is well-nigh universal. It is worthy of note, however, that it is not universal, for when the margin of safety over the bond interest is very large, the offering-house is very quick to emphasize "net earnings after depreciation and taxes are available for interest charges," even to the extent of putting some of the words in italics to emphasize the strength of the statement. After all, the conservative attitude is the one that carries the greatest conviction.

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The first Department, "Summaries of Business Research," comprises summaries of the results of the investigation of various business subjects. "Case Studies in Business," the second of these Departments, was suggested by one of the outstanding characteristics of the Graduate School of Business Administration, the case method of teaching. Case studies are based upon the actual experiences of business concerns; to avoid disclosure of confidential material, however, it is necessary to disguise the names of the concerns. The last of the Departments contains critical reviews and short descriptions of new books of interest to business men.

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SUMMARIES OF BUSINESS RESEARCH

COTTON FORECASTING: A METHOD OF DETERMINING IN NOVEMBER THE ADVISABILITY OF HOLDING THE CROP

I

THE holding of any crop by the producer, whether on his farm or in a warehouse, involves some cost. The elements of this carrying cost vary among crops and among farmers and are not the same for different localities; students of the problem are not agreed as to their amounts. Generally speaking, the farmer can market his products most cheaply as soon as they are ready for market; cotton can be sold from the gin platform the day it is baled with a minimum of hauling, storage, insurance, interest, and wastage expenses.

The purpose of this study is to determine the advisability of holding cotton by the producer for periods longer than are required in the usual process of marketing. First, the costs to the producer which accumulate from month to month are compared with the prices of cotton in the corresponding eight successive months in order to determine the profits or losses which accrue by reason of the holding. In the second section, the methods of forecasting possible profit in holding are discussed—considerations which affect equally the buyer of cotton and the producer.

There are very wide variations in some of the elements of carrying charges. In order to give the holding farmers the benefit of any doubts which may arise, it seems best to leave such items out of account in the summary of costs. For instance, cotton in storage suffers a loss in weight which is at a maximum when it is left on the farm and least when in a modern warehouse. In the case of long staple cotton, storage causes also a shortening of fiber coupled with a loss of tensile strength. In the case of farm storage, hauling charges are sometimes large; usually, after the cotton has been placed in a warehouse there are no more hauling charges. Some farmers carry no insurance. Rates vary widely with the place of storage and the type of warehouse. None of these costs or losses—hauling, insurance, lessening of weight or shrinkage and weakening of fiber—is capable of exact measurement when applied to the cotton crop as a whole; in some cases they are large; in others, small; and in some instances, nothing. These costs cannot be measured, but to include them that they might change cost and risk in all cases would tend to strengthen the conclusion.

Warehouse charges have been stable at least for the last 15 years. Since, however, no tariffs have been published for warehouses in wide areas of the cotton belt, a sample of what seem to be typical charges must be used. A writer[1] on this subject in 1916 chose, as the most representative expense for the period beginning in 1904, 50 cents per bale for the first month, 25 cents monthly thereafter. An examination has been made of the New Orleans ter-

[1] Pope, J. E. *Quarterly Journal of Economics*, 1916.

TABLE I. GAINS OR LOSSES PER POUND OF COTTON INCURRED BY HOLDING AND SELLING IN THE MONTH SPECIFIED 1904-1905—1922-1923

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
1904–05												
Selling Price		11.1	10.3	9.8	7.9	7.2	7.8	8.0	7.9	8.4	9.3	10.7
Carrying Charges	....	....	....	....	.15	.25	.35	.45	.55	.65	.75	.85
Net Selling Price	....	....	....	....	7.8	7.0	7.5	7.6	7.4	7.8	8.6	9.9
Profit (+) or Loss (−)	....	....	....	....	−2.0	−2.8	−2.3	−2.2	−2.4	−2.0	−1.2	+ .1
1905–06												
Selling Price	....	10.9	10.3	11.5	12.1	11.8	11.1	11.4	11.7	11.7	11.1	10.9
Carrying Charges	....	....	....	....	.16	.27	.38	.49	.60	.71	.82	.93
Net Selling Price	....	....	....	....	11.9	11.5	10.7	10.9	11.1	11.0	10.3	10.0
Profit (+) or Loss (−)	....	....	....	....	+ .4	....	− .8	− .6	− .4	− .5	−1.2	−1.5
1906–07												
Selling Price	....	9.8	10.8	10.8	10.9	10.9	11.1	11.2	11.2	12.2	13.0	13.2
Carrying Charges	....	....	....	....	.15	.25	.35	.45	.55	.65	.75	.85
Net Selling Price	....	....	....	....	10.8	10.7	10.8	10.8	10.7	11.6	12.3	12.4
Profit (+) or Loss (−)	....	....	....	....	....	− .1	....	....	− .1	+ .8	+1.5	+1.6
1907–08												
Selling Price	....	12.7	11.4	11.2	12.0	11.7	11.6	11.0	10.2	10.9	11.8	11.1
Carrying Charges	....	....	....	....	.16	.27	.38	.49	.60	.71	.82	.93
Net Selling Price	....	....	....	....	11.8	11.4	11.2	10.5	9.6	9.2	11.0	10.2
Profit (+) or Loss (−)	....	....	....	....	+ .6	+ .2	....	− .7	−1.6	−2.0	− .2	−1.0
1908–09												
Selling Price	....	9.5	9.2	9.4	9.2	9.6	9.8	9.7	10.4	11.3	11.6	12.6
Carrying Charges	....	....	....	....	.15	.25	.35	.45	.55	.65	.75	.85
Net Selling Price	....	....	....	....	9.1	9.4	9.5	9.3	9.9	10.7	10.9	11.8
Profit (+) or Loss (−)	....	....	....	....	− .3	....	+ .1	− .1	+ .5	+1.3	+1.5	+2.4
1909–10												
Selling Price	....	13.1	14.2	14.7	15.4	15.0	14.7	15.0	14.9	15.3	15.0	15.9
Carrying Charges	....	....	....	....	.17	.29	.41	.53	.65	.77	.89	1.01
Net Selling Price	....	....	....	....	15.2	14.7	14.3	14.5	14.3	14.5	14.1	14.9
Profit (+) or Loss (−)	....	....	....	....	+ .5	....	− .4	− .8	− .4	− .2	− .6	+ .2
1910–11												
Selling Price	....	14.6	14.3	14.8	15.0	14.9	14.5	14.4	14.9	15.8	15.4	13.7
Carrying Charges	....	....	....	....	.17	.29	.41	.53	.65	.77	.89	1.01
Net Selling Price	....	....	....	....	14.8	14.6	14.1	13.9	14.3	15.0	14.5	12.7
Profit (+) or Loss (−)	....	....	....	....	....	− .2	− .7	− .9	− .5	+ .2	− .3	−2.1
1911–12												
Selling Price	....	11.2	9.8	9.5	9.4	9.5	10.3	10.6	11.4	11.6	11.7	12.5
Carrying Charges	....	....	....	....	.15	.25	.35	.45	.55	.65	.75	.85
Net Selling Price	....	....	....	....	9.3	9.3	10.0	10.2	10.9	11.0	11.0	11.7
Profit (+) or Loss (−)	....	....	....	....	− .2	− .2	+ .5	+ .7	+1.4	+1.5	+1.5	+2.2
1912–13												
Selling Price	....	11.7	11.2	12.4	13.0	13.1	12.8	12.7	12.2	12.0	12.1	12.2
Carrying Charges	....	....	....	....	.16	.27	.38	.49	.60	.71	.82	.93
Net Selling Price	....	....	....	....	12.8	12.8	12.4	12.2	11.6	11.3	11.3	11.3
Profit (+) or Loss (−)	....	....	....	....	+ .4	+ .4	....	− .2	− .8	−1.1	−1.1	−1.1
1913–14												
Selling Price	....	13.5	14.1	13.7	13.0	12.7	12.8	13.4	13.2	13.7	13.5	12.9
Carrying Charges	....	....	....	....	.17	.29	.41	.53	.65	.77	.89	1.01
Net Selling Price	....	....	....	....	12.8	12.4	12.4	12.9	12.6	12.9	12.6	11.9
Profit (+) or Loss (−)	....	....	....	....	− .9	−1.3	−1.3	− .8	−1.1	− .8	−1.1	−1.8
1914–15												
Selling Price	....	8.7	7.8	6.3	6.8	6.6	7.4	7.4	8.1	9.1	8.6	8.6
Carrying Charges	....	....	....	....	.13	.21	.29	.37	.45	.53	.61	.69
Net Selling Price	....	....	....	....	6.67	6.39	7.11	7.03	7.65	8.57	7.99	7.91
Profit (+) or Loss (−)	....	....	....	....	+ .37	+ .09	+ .81	+ .73	+1.35	+2.27	+1.69	+1.61
1915–16												
Selling Price	8.1	8.5	11.2	11.6	11.2	11.4	11.5	11.1	11.5	11.5	12.5	12.5
Carrying Charges	....	....	....	....	.16	.27	.38	.49	.60	.71	.82	.93
Net Selling Price	....	....	....	....	11.0	11.1	11.1	10.6	10.9	10.8	11.7	11.6
Profit (+) or Loss (−)	....	....	....	....	− .6	− .5	− .5	−1.0	− .7	− .8	+ .1	....
1916–17												
Selling Price	....	14.6	15.5	18.0	19.6	17.1	16.8	15.9	18.0	18.9	20.2	24.7
Carrying Charges	....	....	....	....	.19	.33	.47	.61	.75	.89	1.03	1.17
Net Selling Price	....	....	....	....	19.4	16.8	16.3	15.3	17.3	18.01	19.2	23.5
Profit (+) or Loss (−)	....	....	....	....	+1.4	−1.2	−1.7	−2.7	− .7	+ .01	−1.2	+5.5
1917–18												
Selling Price	24.3	23.4	23.3	27.3	27.7	28.9	29.7	30.2	31.8	28.5	27.4	28.6
Carrying Charges	....	....	....	....	.24	.43	.62	.81	1.0	1.19	1.38	1.57
Net Selling Price	....	....	....	....	27.5	28.5	29.1	29.4	30.8	27.31	26.00	27.0
Profit (+) or Loss (−)	....	....	....	....	+ .2	+1.2	+1.8	+2.1	+3.5	+ .01	−1.28	− .27
1918–19												
Selling Price	27.8	32.2	31.8	29.3	27.6	28.7	24.9	24.0	24.5	26.0	29.5	31.1
Carrying Charges	....	....	....	....	.25	.45	.65	.85	1.05	1.25	1.45	1.65
Net Selling Price	....	....	....	....	27.4	28.3	24.3	23.2	23.5	24.8	28.1	29.5
Profit (+) or Loss (−)	....	....	....	....	−1.9	−1.0	−5.0	−6.1	−5.8	−4.5	−1.2	+ .2
1919–20												
Selling Price	32.5	30.8	31.3	36.5	35.6	35.9	36.2	36.2	37.3	37.7	37.2	37.4
Carrying Charges	....	....	....	....	.28	.51	.74	.97	1.2	1.43	1.66	1.89
Net Selling Price	....	....	....	....	35.3	35.4	35.5	35.2	36.1	36.3	35.5	35.5
Profit (+) or Loss (−)	....	....	....	....	−1.2	−1.1	−1.0	−1.3	− .4	− .2	−1.0	−1.0
1920–21												
Selling Price	36.8	31.1	25.5	19.4	13.9	11.5	11.8	10.3	9.4	9.4	9.8	9.6
Carrying Charges	....	....	....	....	.2	.35	.5	.65	.8	.95	1.1	1.25
Net Selling Price	....	....	....	....	13.7	11.2	11.3	9.7	8.6	8.5	8.7	8.4
Profit (+) or Loss (−)	....	....	....	....	−5.7	−8.2	−8.1	−9.7	−10.8	−10.9	−10.7	−11.0
1921–22												
Selling Price	9.8	12.6	19.8	17.7	16.2	16.3	15.5	15.9	16.0	15.9	18.7	20.4
Carrying Charges	....	....	....	....	.19	.33	.47	.61	.75	.89	1.03	1.17
Net Selling Price	....	....	....	....	16.0	16.0	15.0	15.3	15.3	15.0	17.67	19.2
Profit (+) or Loss (−)	....	....	....	....	−1.7	−1.7	−2.7	−2.4	−2.4	−2.7	− .03	+1.5
1922–23												
Selling Price	20.7	21.1	22.4	23.8	24.5	25.9	27.7	28.4	26.9	25.6	26.2	23.5
Carrying Charges	....	....	....	....	.22	.30	.56	.73	.9	1.07	1.24	1.41
Net Selling Price	....	....	....	....	24.3	25.6	27.1	27.7	26.0	24.5	25.0	22.1
Profit (+) or Loss (−)	....	....	....	....	+ .5	+1.7	+3.3	+3.9	+2.2	+ .7	+1.2	−1.7

minal warehouse tariff of 1921 and several sales reports dated 1920 upon which storage charges of warehouses in the central Yazoo-Mississippi Delta were listed. The expenses indicated by these papers were substantially the same as those which were used in 1916. Many farmers do not store their crop when holding it, but the greater loss from rot and other deteriorating influences will, in most cases, more than offset the storage charges. A definite amount may be reasonably assigned to storage costs for the purposes of this study; they are fixed at 50 cents per bale for the first month and 25 cents monthly thereafter.

The determination of the proper interest charge is more difficult. It is likely that for the small farmers and share-croppers, who produce the larger part of the crop in many sections, the cost of borrowed money has been on the average at least 10%,[2] and, in many instances, much more. Interest rates on loans secured by actual cotton, however, are lower than on borrowings based on the crop during the growing season. There are also many large planters who borrow money from large city banks and pay only 6% per annum. Here, as in other instances, the benefit of the doubt is given to the farmer, and the minimum, 6% per annum, rather than an estimated average or mode, is used as the interest charge.

The Bureau of Agricultural Economics of the United States Department of Agriculture (formerly the Bureau of Markets) publishes actual farm prices of cotton as of the first of each month and an average of the high and low prices of each month in 41 interior cotton centers (28 before 1916). Farm prices move more slowly than do city prices; the seasonal movements of the two are not identical, and the amplitude of fluctuations at times is greater. Over a long period of time, however, the two series are not greatly at variance. The farm prices, however, have been available only since 1913; from 1904-1905 to 1913-1914 prices at the cotton centers were used.[3] From 1914-15 to 1922-23 the prices used are those of the farm. Although these latter cover only one day each month, they are likely to be typical, since, as has already been pointed out, farm prices do not change rapidly. Costs of storage and interest are calculated for calendar months; on the whole, computations based on either set of prices should not differ materially from each other.

In Table I the calculations for each month of the holding period are given. It is assumed that, on the average, the crop is ready for the market in November and that the holding period begins on the first of that month. The costs are worked out until the first of the following July, about one month before the new crop begins to move. The carrying charges included are those for interest at the rate of 6% per annum and storage at 50 cents per bale for the first month and 25 cents monthly thereafter. Interest is assumed to begin on November 1. The unit is a single pound of cotton; bales are assumed to be uniformly 500 pounds in weight.

The table on the next page shows the number of months of the holding period of each year in which the farmer might have sold at a profit or loss, together with those months in which there was neither a gain nor a loss.

It is apparent that in only six years out of the past nineteen have there been more months in which cotton held from

[2] *Bulletin 409*, U. S. Dept. of Agriculture, 1916.

[3] These prices were used also by Pope.

the preceding November could be sold at a profit rather than at a loss. In only one year were profits to be made in each month of the holding period. That was

TABLE II. MONTHS OF HOLDING PERIODS IN WHICH COTTON MIGHT HAVE BEEN SOLD AT PROFIT, LOSS, OR "EVEN"

Year	Gain	Loss	Even
1904-1905	1	7	..
1905-1906	1	6	1
1906-1907	3	2	3
1907-1908	2	5	1
1908-1909	5	2	1
1909-1910	3	4	1
1910-1911	1	6	1
1911-1912	6	2	..
1912-1913	2	5	1
1913-1914	..	8	..
1914-1915	8	..	..
1915-1916	1	..	..
1916-1917	3	4	1
1917-1918	5	2	1
1918-1919	1	7	..
1919-1920	..	8	..
1920-1921	..	8	..
1921-1922	1	7	..
1922-1923	7	1	..

the year 1914-1915, a most abnormal one. There were three years, however, in which there were losses in every month after November. If the unmeasured costs were taken into account, the months in which there was neither loss nor gain would be shifted to the loss column. The results would be still more decidedly unfavorable to holding.

The period under consideration was by no means homogeneous. Radical changes occurred in the price level of cotton, as in that of other commodities, in 1916 and the years following. Not only have there been rapid rises, but equally abrupt falls in prices. Momentous changes in the conditions of export, manufacturing, and marketing also occurred during the period. Despite these changes the results of holding cotton seem to have been the same. In proportion to the number of years included in these two unlike periods, it is apparent that the new price level and the partial loss of the foreign market have not tended to make holding either more or less profitable.

If an attempt had been made to approximate, even roughly, the extra costs of hauling, insurance, and deterioration, the results would have been even more emphatic against holding, as a general policy. The gains or losses arising in connection with holding cotton from month to month before the height of the season are as follows:

Holding Period	Gain	Loss
August to September	7	8
August to October	7	8
August to November	9	6
September to October	7	8
September to November	9	6
October to November	8	7

Apparently November is the month in which, for the larger number of years, sales can be made to best advantage. It does not follow that November always is the best month in which to sell, but the choice of November as the month in which holding starts appears to be justified.

To summarize the conclusions:

A. The holding of cotton has yielded a profit only in six out of the last nineteen years; with one exception there were months in these six years in which losses might have been incurred by sale of cotton held from the previous November.

B. The results would have been more decidedly unfavorable to holding if the costs not capable of exact measurement had been included.

C. In more than half of the years November was the most favorable month in which to sell.

D. In four out of the six years in which holding has been profitable the greatest gains were made by July sales. This seems to indicate that the profitableness of holding has been caused in large part by the upward movement of the general price level rather than by conditions affecting cotton alone.

II

The prices have been examined; it will be of interest to inquire into the causes of their fluctuations and find whether subsequent price movements can be predicted accurately in November. From the point of view of the producer, the forecast will show the profit or loss in holding his crop for each particular year. To the buyer of cotton, the same forecast will aid in determining the advisability of early buying. The factors which have a bearing on cotton prices may be divided into three groups: A. General Business Conditions; B. Cotton Production; C. Cotton Consumption.

The conditions of general business could not be measured with any great degree of accuracy, by the great mass of business men at least, 20 or even 10 years ago. There are today a large and increasing number of publications and agencies which attempt to forecast trends, so that a close approximation of what students and statisticians think will happen in the near future is available. The data published by these agencies furnish a source from which anyone may make his own deductions.

The figures relating to cotton production which are available in November are probably the least satisfactory of all cotton data. The most accurate are those of the United States Department of Agriculture. Even these, although over the whole period much more accurate than estimates of private agencies, nevertheless have been badly inaccurate at times. On account of this incorrectness in the November production estimates, the price of cotton on occasions has been disturbed materially, both at the time when the first estimate was made public, and again when the revisions or actual production became known. A second confusing factor in gaging the current yearly crop on the first of November is the fact that foreign production estimates are much more inaccurate than those of the United States. Further, they are not available until much later.

There have been published for many years accurate data regarding cotton consumption. The exports of cotton from, and imports into, the United States, spindle activity, consumption of raw cotton by the mills, and stocks, exports, and imports of cotton cloth are available now, although the compilation of cloth statistics was begun only recently.

In making this study the general business conditions in each year are to be considered first. The trends of bank clearings, commodity prices and interest rates may be used.[4] In no one of the nineteen years have cotton prices manifested marked fluctuations in a trend opposed to that which these indices had exhibited previous to November.

In order to gage production it is necessary to consider two groups of data—the Government estimates of production, and ginning reports—(See Tables III and IV). The final production estimate is in September; it has been in error by amounts ranging from .8% (1918) to 21.7% (1921). Thus, no great reliance can be placed in an estimate where the degree of accuracy va-

[4] From the charts published by the Harvard Committee on Economic Research.

TABLE III. A COMPARISON OF GOVERNMENT ESTIMATES WITH ACTUAL PRODUCTION

	Estimate	Actual	Error	Percentage of Error
1904	12,162,700	13,451,337	* 1,288,637	10.6
1905	10,167,818	10,495,105	* 327,287	3.2
1906	12,546,000	12,983,201	* 437,201	3.5
1907	11,678,000	11,057,822	† 620,178	5.3
1908	12,920,000	13,096,005	* 166,005	1.3
1909	10,088,000	10,072,731	† 15,269	.15
1910	11,426,000	11,568,334	* 142,334	1.2
1911	16,692,701	15,553,073	† 139,629	.9
1912	13,820,000	13,488,539	† 331,461	2.4
1913		13,982,811		
1914		15,905,840		
1915	10,950,000	11,068,173	* 118,173	1.1
1916	11,637,000	11,363,915	† 273,085	1.7
1917	12,047,000	11,248,242	† 798,758	6.6
1918	11,818,000	11,906,480	* 88,480	.8
1919	10,696,000	11,325,532	* 629,532	5.9
1920	12,123,000	13,270,970	* 1,147,970	9.5
1921	6,537,000	7,954,000	* 1,417,000	21.7
1922	10,100,000	9,900,000	† 200,000	2.0

* Underestimate. † Overestimate.

ries so widely. It appears, however, that by correcting the final production forecasts by means of the gin reports published in November, and taking into account existing and temporary disturbances, one may arrive at an estimate in which the amount of error will not be appreciable. The gin reports as of November 1 and 14, afford a check upon the earlier forecasts. For instance, the estimate of the total production for the year available in November, 1917, was 12,047,000 bales. This later proved to be an overestimate of 6.6%. On November 1 of that year 7,185,178 bales had been ginned; the average percentage of the total crop ginned before November 1 in the 12 preceding years was 63.8. Using this latter figure as the most likely proportion of the current year's production ginned by November 1 it was possible to estimate the 1917 production at 11,261,094, an overestimate of .11 of 1%. The final estimate in 1914 proved to be 7.7% short of the actual crop. An estimate based on the gin figures of November 1, arrived at in the same manner as that just outlined, was .5% under the actual, and a forecast based on the November 14 report computed by the identical method was 1% over true condition. It is true, of course, that there is no precise means by which to judge which of these estimates should be given most weight in any specified year; current circumstances —excessive rainfall or a shortage of pickers—must be given due significance. In 1907-1908 and 1921-1922 it apparently was impossible to forecast the advisability of holding because of the inaccuracy of the Government estimates

TABLE IV. THE GINNING REPORTS PUBLISHED IN NOVEMBER

	Cotton Ginned to November 1	Per Cent of Total Crop	Cotton Ginned to November 14	Per Cent of Total Crop
1903			6,815,162	69.4
1904			9,786,646	72.8
1905	6,457,995	61.5	7,501,180	71.5
1906	6,906,395	53.2	8,562,252	65.9
1907	6,128,562	55.4	7,300,665	66.0
1908	8,191,557	62.6	9,595,809	73.3
1909	7,017,849	69.7	8,112,199	80.5
1910	7,345,953	63.5	8,780,433	75.9
1911	9,970,905	64.1	11,313,236	72.7
1912	8,869,222	65.8	10,299,646	76.4
1913	8,830,396	63.2	10,444,929	74.7
1914	9,826,912	61.8	11,668,240	73.4
1915	7,378,886	66.7	8,771,275	79.2
1916	8,623,893	75.9	9,615,003	84.6
1917	7,185,178	63.9	8,571,115	76.2
1918	7,777,159	65.3	8,706,420	73.1
1919	6,305,054	55.7	7,604,320	67.1
1920	7,508,633	56.6	8,914,642	67.2

together with the failure of the gin reports to conform closely to the average of the previous years. In addition to the above mentioned years the estimates were badly out of line in 1904, 1919, and 1920. In these latter instances, however, there was sufficient evidence to enable the observer to discount the Government forecasts.

Under the head of consumption may be considered the actual consumption by mills of the United States, exports of domestic cotton (together with the net imports—an almost negligible item) the total and active spindles in the United States as well as the spindleage which consumed cotton mixed with other fibers.

Exports and domestic consumption are to be compared with the total crop in order to determine whether the domestic stocks are likely to be augmented or diminished. The trend of the percentage of active spindles was calculated in order to find whether or not a change in the rate of consumption could be expected for the following year.[5] Large stocks and a large proportion of idle spindles are connected uniformly with low prices, and vice versa, but all the facts of consumption must be considered in conjunction with general business conditions and production.

At times what usually are termed accidental movements of the business cycle affect the price of cotton. The most notable of these was in the first months of 1917, when it became apparent that the United States would be drawn into the war. The effects on current prices of the outbreak of the war in midsummer 1914 were obvious in November of that year.

These elements of forecast form the basis upon which each producer and buyer may determine whether to sell or hold, to buy early or late. In the cotton market, the same factors combine in the

[5] All consumption figures may be obtained from the *Commercial and Financial Chronicle*.

tangible result of price. The effect of large additions to the supply of cotton is to depress the prices in November to a point below the level which the actual conditions warrant. Thus, the indications are that the years in which there was a larger crop than usual or a substantial increase over the year before were more favorable for holding than others. The years in which there were more months in which cotton held over could be sold with a profit than those in which losses would be incurred were 1906-1907, 1908-1909, 1911-1912, 1914-1915, 1917-1918, and 1922-1923. In every case except 1917-1918 the crop was at least 1,900,000 bales greater than the preceding year. This seems to indicate that in years in which there are large crops the prices [6] prevailing in November more than discount the effect of the added supply.

III

The holding of cotton for eight months after November has been profitable for every month of the period only once in the past nineteen years. In five other years the gains more than offset the losses. In all except three years there were sufficient factors in evidence in November to enable one to approximate the profits or losses of holding. Exact gains or losses, of course, could not be foretold. It was pointed out at the close of the first section that in four years out of the six in which holding was advantageous the indications were that the gain accrued because of upward swings of the price level. (Examination of the price indices for these years confirms the indication.) Economists and statisticians lately have been able to predict movements of prices with accuracy for periods of a year in the future. In periods of large changes in these levels, therefore, there will be no resultant difficulty in judging the expediency of holding. In all these years the most disturbing factor has been the inaccuracy of the Government estimates. But, on the other hand, the gin reports furnish usually a correcting factor by which this lack of precision may be offset. Finally, these facts may be applied to a correction of market opinion expressed in price.

On the whole, it appears that, in the absence of accidental cyclical movements of major importance, the benefits of holding cotton can be foreseen in November.

[6] This refers to the prices to the producer. The futures market is not taken into account.

CASE STUDIES IN BUSINESS

THE HOLDING COMPANY AS AN AID IN REORGANIZATION

THE Henry F. Lucas Implement Company, manufacturing wood and steel threshing machines, gas and steam tractors and portable sawmills, was an old established concern, with five subsidiaries in the Middle West and West for marketing its products and furnishing repair service. The excellent reputation of the company and its products had been chiefly responsible for the financial standing which it had attained. The company had good banking connections in six large cities, through which it was a consistent borrower. It borrowed also to some extent on the open market. Like the sales of all concerns making machinery for farmers, those of the Lucas Company were made on long credit terms. The length of credit ranged from two to four years, necessitating, therefore, large financial resources, either in owned capital or in lines of credit.

In 1919 and the early part of 1920, sales were large and as a result the borrowings of the Lucas Company were unusually heavy. This money went largely into inventory and receivables, which at the end of 1920 composed 90% of the current assets and over 70% of the total assets.

Difficulties of the Company

Sales slumped badly in the later months of 1920, and it became apparent that customers were not reducing their obligations. In the spring of 1921, one of the largest creditor banks investigated the condition of the company's subsidiaries and reached the conclusion that the business of these subsidiaries was not yielding the company sufficient profit to justify their continued operation. For example, at one branch it was learned that the company had $500,000 in inventory, and a like amount in receivables. Exclusive of other investment this branch showed a turnover of sales to investment of one-half, as sales for 1920 had been $500,000. The bank renewed its loan only with the understanding that the company would curtail operation in its subsidiaries and make every effort to reduce its notes payable to the bank.

The 1921 statement showed continued stagnation of receivables and a drop in sales to half the 1920 figure, causing an operating loss of $87,000. A meeting was called of representatives from 12 depository banks which were involved with loans ranging from $95,000 to $575,000 each. This committee of creditors also represented about 200 small country banks which owned $2,500 to $10,000 of the paper sold by note brokers.

The company's position, as stated to the committee, was typical of concerns selling to farmers during periods of agricultural depression. It was impossible for the company to pay its notes. It had tried to collect its receivables but had found that while the farmers signified willingness to pay eventually, they could not pay for three or four years. Further, it had discovered that if it tried to force payment, the farmers would turn back the machinery, since

the replacement price of each type of implement was substantially lower than the face of the note which the company held. It was considered impracticable to shut down the plant, because the farmers would refuse to meet their obligations if repair parts were not constantly available.

Further meetings of the committee were held, and on April 3, 1922, the banks decided to renew the notes which they held, at or before maturity, at 7%, and to require payment in full by December 1, 1922. A small additional amount was loaned to complete the manufacture of raw materials for shipment to subsidiaries for the 1922 season.

The consolidated balance sheet of October 1, 1922, showed notes receivable of $2,556,000 and accrued interest of $198,000. This with an inventory of $2,105,000 constituted 94% of the current assets. Sales to October 1 had been only $808,000.

Comparative consolidated balance sheets were as shown in Table I.

It was apparent that default would come on December 1, if a plan were not evolved by the banks to reconstruct the company's finances. Accordingly a meeting of the bankers' committee was called on October 1, 1922, to decide whether the assets of the company should be liquidated or a reorganization attempted. If the assets were liquidated, it was estimated that the banks would recover not more than 20% of their claims, particularly since the farmers would refuse to pay their notes if the plant were shut down and repair parts were not available. If the reorganization were consummated it would be necessary, first, to eliminate the incapable financial management, retaining the minor executives to handle the administrative work; and, secondly, to obtain $625,000 for working capital for the rehabilitated concern.

At first, four of the twelve banks desired liquidation. Their representatives asserted that everything possible had been done for the company; that their capital had been invested in the business for over two years, and they did

TABLE I. COMPARATIVE CONSOLIDATED BALANCE SHEETS OF 1920, 1921, AND 1922

ASSETS	In Thousands of Dollars			LIABILITIES	In Thousands of Dollars		
	12/31 1920	12/31 1921	10/1 1922		12/31 1920	12/31 1921	10/1 1922
Cash	268	126	168	Notes Payable	3,019	3,175	3,320
Notes Receivable	2,384	2,438	2,556	Accounts Payable	127	48	41
Accounts Receivable	111	102	122	Accruals	184	151	..
Inventory	3,233	2,700	2,105	Cert. of Dep.	...	77	61
Accr. Int. on N. R.	152	190	198	Com. Cert. to Agts.	...	9	92
Liberty Bonds	56	4	3				
Current Assets	6,204	5,560	5,152	Current Liabilities	3,330	3,459	3,514
Land and Buildings	1,322	1,352	1,360	Res. Depr. and Loss	653	395	395
Investments	55	55	55	Preferred Stock	513	513	513
Deferred Charges	22	29	136	Common Stock	762	762	762
Outside R. E.	71	62	68	Surplus	1,969	1,705	1,516
Treasury Stock	..	18	19	Undivided Profits	441	236	88
Subsid. Bal.	..	..	4	Other Liabilities	6	6	6
	7,674	7,076	6,794		7,674	7,076	6,794

not desire to have their money tied up any longer. Nor did they wish to invest additional money in the reorganized company. Furthermore, they felt that conditions in the industry did not appear conducive to a rapid or substantial recovery of business.

The majority of the banks felt that, since they had been lenient for a year, this policy should be continued and an effort made toward friendly reorganization. They expressed confidence that it would be possible to realize eventually 100% on the loans and that a sacrifice of 80% of principal through liquidation was unjustifiable. These banks further contended that the company had a valuable asset in the good-will created by 80 years of gratifying performance of Lucas implements. In the event of liquidation this would yield little return.

Plan of Reorganization

The plan proposed by the eight banks which favored reorganization included revision of production, of distribution, and of the financial structure. Without greater economy in production and distribution it was felt that no plan of reorganization could be successful.

Savings in production could be made on raw materials, equipment and labor by concentrating on those products for which there was the largest sale. Portable sawmills and several models of tractors were therefore to be eliminated from the Lucas line. The final recommendation called also for the elimination of wooden threshing machines. In the manufacture of these implements it was necessary to season the lumber for two years; consequently this required tying up capital in three years' supply of lumber, while with the steel thresher, a 60-day turnover of material was obtained.

They believed that the subsidiary business was too widely scattered to be wisely pursued and advised the discontinuance of the branches and a concentration of the company's distribution in the central states. While this would narrow their market considerably, yet it would rid the company of a part of its business which had been unprofitable and would set free for use as working capital a considerable investment. The smaller market could be worked more intensively.

The financial need was, of course, for working capital. The great difficulty in such situations is to provide means for giving the new capital a lien prior to that of the old debts of the company, for no one will put money into a concern undergoing reorganization if he must take a position behind all the old creditors. The plan of reorganization finally adopted for the Lucas Company was unusual and was good in that it solved this difficulty in a simple way, with a minimum of legal complication.

A holding company was to be formed, which would take over the stock and real estate and assume the bank debts of the old company. Voting control was to be vested in 100 shares of Class A Common Stock held by the bankers' committee as Board of Directors of the holding company. The operating company was to pay as rental to the holding company all interest on indebtedness and all taxes and, in addition, surplus earnings and receipts from the collection of outstanding receivables above the amount which it was advisable to retain for operations. These proceeds were to be applied by the holding company to the reduction of the indebtedness to the banks. About 60% of the bank loans taken over were to be replaced by $2,000,000 in bonds of the holding company. The $625,000 needed

at once for working capital was to be loaned by the banks to the operating company. The holding company would retain the right to mature outstanding indebtedness, terminate the agreement, and liquidate the business at any time, should it appear that the plan was not working to advantage. When all bank debts incurred by the old management were paid, the 100 shares of Class A Common Stock held by the banks were to be returned to the stockholders of the old company.

The balance sheets reproduced in Table II represent the condition after the formation of the holding company, the issue of the bonds, and the granting of the $625,000 loan.

Value of the Plan

The advantage of the plan is apparent. The operating company would be left with $5,777,000 in current assets and only $819,000 in current liabilities, of which $625,000 was the new bank loan. Thus, as far as the Henry F. Lucas Implement Company was concerned, practically all the old debt would have been wiped out. Any new money put in would have a first claim on five million dollars' worth of current

TABLE II. BALANCE SHEETS OF PROPOSED COMPANIES

HOLDING COMPANY

(In Thousands of Dollars)

ASSETS		LIABILITIES	
Land and Buildings	1,360	Bonds	2,000
Preferred Stock Oper. Co.	513	Notes Payable	1,320
Common Stock Oper. Co. (Book value)	4,728	Preferred Stock	513
		Common A.	1
		Common B.	76
		Surplus	2,691
	6,601		6,601

OPERATING COMPANY

(In Thousands of Dollars)

ASSETS		LIABILITIES	
Cash	793	Notes Payable	625
Notes Receivable	2,556	Accounts Payable	41
Accounts Receivable	122	Certificates of Deposit	61
Inventory	2,105	Commissions Certified to Agent	92
Accrued Interest on A. R.	198		
Liberty Bonds	3	Current Liabilities	819
Current Assets	5,777	Preferred Stock	513
		Common Stock	762
Investments	55	Surplus	3,965
Deferred Charges	136		
Outside Real Estate	68		
Treasury Stock	19		
Subsidiary Balance	4		
	6,059		6,059

assets. In short, from the point of view of obtaining further bank and mercantile credit and working capital, the company's position would be made unusually strong.

In addition, the company would be freed from the pressure of maturing obligations and could allow the gradual liquidation of the receivables which would be necessary if their full value were to be realized.

The banks, by allowing this separation of assets and accepting bonds for part of their notes would sacrifice the priority of their claims on the current assets. However, they would place the company in a firm credit position and assure the security of new loans.

By the time the 40% of bank loans not funded has been paid off, the general credit of the company should be such as to make the bonds—which are secured by direct mortgage on the real estate and by pledge of the earnings of the operating company—of good market value. They can then be disposed of at slight sacrifice or held until maturity. In either case the banks will have realized practically the full value of their loans.

The difficulties which made necessary the reorganization of the Henry F. Lucas Company were experienced in greater or less degree throughout the entire agricultural implement industry. Apparently one of the chief causes of the trouble was insufficient provision for permanent working capital. To rely on continuous borrowing from banks for the greater part of the money needed at all times is to leave no margin of safety against a depression. For the banks to lend continuously and in large amount for permanent use in this way is unwise. Earning assets are allowed to become non-liquid and assume the form of a permanent investment. In such an industry as this the amount of working capital provided by the stockholders should be much larger than the average.

During periods of unusual prosperity and rising prices special care should be exercised to build up a strong cash position. The costs of increasing sales and production are incurred coincidentally with the sales, but the actual cash profits are not realized until much later. In this way many concerns have been forced into bankruptcy because of failure to protect their cash position. Such a period would be a strategic time to strive for larger cash payments and shorter-term notes on sales. Farmers are then able to meet such terms, and manufacturers have sufficient business so that there is not the pressure, felt during times of dull business, to use long-credit terms as a weapon in competition.

The bankers' committee handled the reorganization of the Lucas Company well. It was wise not to take over the direct administrative management of the operating company, for bankers cannot claim to be skilled in the management of a manufacturing business. The function of the bankers in the reorganized company was to develop a financial policy which would be secure in all phases of the business cycle.

The placing of the production and distribution on a more efficient and profitable basis was an element in the reorganization, the importance of which should not be overlooked, but the outstanding feature was the use of the holding company as a means of separating the assets and liabilities in such a way as to permit new money to secure a first claim on the large working assets of the company. This is an unusual method of meeting what is recognized as the great difficulty in an industrial reorganization, and it appears to be both simple and effective.

CANCELATIONS[1]
THE HARRISON STEEL CORPORATION

EARLY in August, 1920, the Harrison Steel Corporation received a request for cancelation of a tonnage contract from the Tyler Warehousing Corporation, one of its largest customers. A long-sustained period of prosperity and high prices was just ending, and the steel industry was beginning to feel the depression which had already become evident in some other businesses. For the preceding 18 months there had been a steady demand for steel and a continual rise in prices. As a result there had been practically no cases of cancelation of orders by customers. In fact, customers who ordered on the tonnage basis to resell had fallen into the habit of placing their orders with several steel manufacturers for perhaps three times the amount of steel that they expected to need, in order to obtain sufficiently prompt deliveries from some source to satisfy their own customers.[2]

This contract which the Tyler Warehousing Corporation wished to cancel was dated May 10, 1920, and called for the delivery of 500 tons of structural shapes monthly for a period of six months. The specifications for the shapes, under the terms of the contract, were to be given by the purchaser each month in anticipation of delivery six weeks later. Two of these monthly instalments had been shipped by the Harrison Steel Corporation and accepted by the Tyler Warehousing Corporation. The third instalment was in process of manufacture under the specifications. The Tyler Corporation was ready to receive this third instalment, but requested that the remaining three shipments be canceled because of lack of orders on the company's books.

In the steel trade there are two types of orders. The first type are given by customers with a definite project in view, requiring a definite product. The amount of the order, the date of delivery, and the specifications for the steel are all given at the time of ordering. The second type of orders, called tonnage contracts, are usually given by jobbers and warehousemen who expect to resell the steel, but do not at the time know in just what form it is wanted. Therefore, these orders include only a contract to take a certain number of tons to be delivered in instalments at stated intervals, for which the specifications will be presented to the steel company a certain time before the delivery date.

In addition to these major forms of contract, there was formerly used the "scale contract," which was an agreement to buy and sell a given amount of steel, the price to be periodically changed in accordance with the price of some commodity entering into the steel. This contract is now very rarely used in the steel industry.

It is with the second type of orders that most of the cancelation trouble

[1] NOTE: From a survey of business in general during the recent depression it is apparent that cancelations are at times a serious problem in many lines of business. A series of cases on this subject has been selected for discussion in this and subsequent issues of the REVIEW. The problem will be treated from the varying angles of different trades, and an attempt will be made to bring out the specialized questions as well as general principles. Any suggestions for avoiding many of the resultant evils will be based on the established fact that cancelations are concomitant with a certain phase of the business cycle. The first of this series will be the case of the Harrison Steel Corporation, which received requests for cancelation in 1920.

[2] M. T. Copeland: *Marketing Problems.*

arises, for it has become customary for steel manufacturers to accept cancelations of these contracts,[3] if it is done before giving specifications for manufacture. The basis for this development is that the manufacturer cannot begin to make steel until he has received specifications. This custom is, however, a considerable burden on the manufacturer. Not only is he held to the contract price on deliveries in case the price rises, but if the price falls he must cancel the order on the request of the buyer. Thus he cannot gain the benefit of a rising market, nor is he protected on a falling market. The buyers cannot be given the entire blame,[4] for the manufacturers have been said to be somewhat at fault in the past. First, because some manufacturers have sold without regard for their ability to deliver. Secondly, it is the opinion of some steel men that the custom of guaranteeing prices against a decline, which arose a few years ago when the trade was somewhat disorganized by the consolidations, and buyers were of the opinion that prices were moved up or down as the U. S. Steel Corporation wished, was originally a chief cause of the tacit permission to cancel in case of a drop in prices.

Since the decision in this case was likely to form the basis for a precedent for the Harrison Steel Corporation, it had to be given careful consideration and analysis. The chief advantage of refusing cancelation seemed to be that it would give a basis for the establishment of a firm policy of refusing to cancel tonnage contracts. This would relieve the manufacturer of the difficulties previously outlined, and give the corporation a certain amount of protection against excessive loss because of a price drop. This would be of particular advantage to the internal management of the company because the size of the labor force and amount of overhead to be incurred over a period of time is decided chiefly on the volume of unfilled orders on the books. Thus if the contracts were binding an immediate upset in carefully laid production plans would not be imminent whenever prices tended to decline.

On the other hand, had it refused to cancel the remainder of the contract, the Harrison Steel Corporation would have run counter to the rather well-established custom of the trade. If cancelation were allowed in this case, other customers could not consistently be refused. The function of the Tyler Warehousing Corporation and similar customers, who bought on a tonnage contract for future resale, was to carry standard structural shapes for immediate delivery on small shipment. Neither of these functions could be adequately carried on by the steel manufacturer, yet they were necessary. In case of a refusal to cancel, these customers would be loaded with steel which they could not dispose of. Financial difficulties would possibly result. Finally, there was the fact to be considered, that by refusing cancelation the Harrison Steel Corporation would incur a considerable amount of ill-will from its customers and under severe competitive conditions would be likely to lose many of them. The Tyler Company was one of a group of these desirable customers.

One method to meet the situation would be that of the United States Steel Corporation just previous to this period.

[3] It is conceivable that the courts may at some future time allow the custom of cancelation (if continued) to be read into the terms of the contract (Cf. Williston, on Contracts, Sec. 653). To date this has not been done. In other respects the tonnage contract is recognized as a valid, binding contract.

[4] *Iron Age*, January 15, 1914, page 213. Editorial.

Through various economic services and its own statistical forecasts, this company in 1920 concluded that the exceedingly good business of the preceding years could not be expected to last. It therefore established a policy of maintaining relatively low prices, accepting only those contracts which were for definite projects and for which the specifications were given at the time of ordering. Thus, although it lost some orders of those customers who wanted prompt deliveries and were willing to pay high prices, the company received orders from people who were fundamentally sound and were ordering for use rather than for resale and speculation. Its record of cancelations in the crisis period was thus much lower than that of the independents who accepted the unsound and "pyramided" orders.

It has further been suggested that a shortening of the contract period would decrease the elements of speculation and over-ordering, the causes of most of the trouble. Both of these last suggestions, however, would have to be put into effect in advance of a period of stress.

The Harrison Steel Corporation had in this case already allowed itself to get into the situation where its customers were asking to be allowed to cancel their contract. The conclusion in this case then seems to be that the Harrison Steel Corporation did rightly in accepting the cancelations in August, 1920; but that in the future the use of a careful analysis of the probable trend of the business would enable the company to improve its contract relations with its customers and to avoid losses inseparable from cancelations.

DECENTRALIZATION OF CREDIT AND COLLECTION CONTROL

THE Aldridge Adding Machine Company, with branches in 120 leading cities, formerly centralized all its credit and collection facilities at the home office. The company manufactured various types of calculating, billing, and bookkeeping machines, which ranged in price from $125 to $1,050. As the number of branches had increased, it had been found that, because of the delay in approving credits, deliveries were being either held up or made without waiting for credit approval from the central office. Collections by mail also resulted in unsatisfactory conditions, which were greatly complicated by the service and repair charges which usually continued as long as the active life of the machine.

An attempt to improve the situation was made by establishing eight geographical districts, in each of which the control of credits and collections was assigned to the district manager. This method proved unsuccessful, since it failed to overcome any of the fundamental disadvantages of centralized control except to speed up slightly the mail service to and from the branches.

The company, therefore, decided on a complete decentralization of credit and collection control, by which each branch manager was made responsible for the credit and collection functions within his territory. A uniform system of accounting was adopted for all branches so that all business would be on the same basis and subject to control accounts in the home office. In order to avoid confusion among customers, the repair and service accounts were consolidated with the sales accounts. Formerly customers who had service charges on new machines had

received two separate bills; henceforth all charges could go on one bill.

This method of handling credits and collections has proved successful during the last three years, in which time the number of branches has increased from 160 to 220.

In formulating a policy of credit control the average concern gives first consideration to the amount of the average sale. According as this is large or small, an index is furnished for deciding whether the central office or branch manager is best fitted to pass on the matter of credit extension. As a rule, the officer in charge of the central office may be expected to have the sounder and more experienced judgment; on the other hand, the branch manager, being on the spot, has a better knowledge of the facts in the case. But even assuming that, at first, the home office is found best fitted to handle credits, a point is reached in the expansion of an organization beyond which the benefits of centralized control are more than overbalanced by the constantly increasing disadvantages.

The experience of the Aldridge Company is a case in point. The constant increase in the number of branches resulted in an increasingly less flexible credit department, and in correspondingly slower credit service for each branch. The purpose in establishing a branch is to facilitate distribution and service to customers. But in facilitating distribution a branch cannot be more effective than the slowest function of that distribution. Thus a single unwieldy credit department tends to nullify the effectiveness of all branches. Whereas, by a decentralization of credits, each branch is compelled to justify itself, and may be more fairly compared with other branches in the determination of relative efficiencies.

The decentralization of collections followed as a logical step, once it had been decided to decentralize credits. A branch manager who has been given the responsibility of authorizing credits is the logical one to collect the money, by way of vindicating his judgment in extending the credit.

In conclusion, it may be said that in a concern handling a product of reasonably low unit-cost, and with an extensive branch organization, the credit and collection functions should be decentralized and entrusted to the individual branch managers.

PAYMENT OF OPERATIVES DURING A TRAINING PERIOD

THE Stockland Mills, a manufacturer of underwear located in a town of 15,000 population, employed approximately 200 people, of whom 150 were women. The company's reputation in the town was good, and it had the confidence of its employees, who seemed to be contented in their work. However, in the summer of 1922, the employment manager, a woman, discovered a high rate of turnover in apprentice labor. The situation, while not serious, nevertheless called for a remedy, and for two reasons. In the first place, it was expensive to hire and pay a girl to learn an operation, and have her leave before the company received any return. Secondly, the mill had tapped almost all the local labor supply, especially for the highly skilled operatives who formed the major part of its working force. To have to go out to the neighboring towns meant an added expense both in advertising and

in offering special inducements to bring prospective operatives to the town in which the mill was situated. Under the conditions as they existed at the time, it seemed wiser to attempt to hold the present apprentices.

When this situation arose, an efficiency bonus plan of wage payment was in operation at the plant. A schedule, made from time studies, established standard time for all operations on all products. Time was counted against the employees for all delays for which they were responsible, such as rest periods and broken threads or needles. Causes of delay not controlled by the operatives, such as waiting for materials and for the repair of machines, were counted as lapsed time. For these hours pay was at the productive rate of each worker for the particular week. In case of a transfer to a new task with which the worker was unfamiliar, payment was also made as for lapsed time. The base day wage (at this time 32 cents per hour) was guaranteed to those whose efficiency was below 70%. At 70% the bonus began with 10% of the base rate—which was a high incentive to reach the level of satisfactory performance. The wages received at the 100% point of efficiency were considered a fair standard of earnings for the workers to receive. Each succeeding efficiency corresponded to a figure known as the bonus factor, which was used in determining the bonus wages.[1]

[1] Computed on a much more simple basis than the Emerson plan of payment, and with no break in method at the 100% point.

TABLE OF BONUS FACTORS

Per Cent	Factor	Rate	Per Cent	Factor	Rate	Per Cent	Factor	Rate
69	= 1.00	x Base Rate	85	= 1.25	x Base Rate	101	= 1.41	x Base Rate
70	= 1.10	x Base Rate	86	= 1.26	x Base Rate	102	= 1.42	x Base Rate
71	= 1.11	x Base Rate	87	= 1.27	x Base Rate	103	= 1.43	x Base Rate
72	= 1.12	x Base Rate	88	= 1.28	x Base Rate	104	= 1.44	x Base Rate
73	= 1.13	x Base Rate	89	= 1.29	x Base Rate	105	= 1.45	x Base Rate
74	= 1.14	x Base Rate	90	= 1.30	x Base Rate	106	= 1.46	x Base Rate
75	= 1.15	x Base Rate	91	= 1.31	x Base Rate	107	= 1.47	x Base Rate
76	= 1.16	x Base Rate	92	= 1.32	x Base Rate	108	= 1.48	x Base Rate
77	= 1.17	x Base Rate	93	= 1.33	x Base Rate	109	= 1.49	x Base Rate
78	= 1.18	x Base Rate	94	= 1.34	x Base Rate	110	= 1.50	x Base Rate
79	= 1.19	x Base Rate	95	= 1.35	x Base Rate	111	= 1.51	x Base Rate
80	= 1.20	x Base Rate	96	= 1.36	x Base Rate	112	= 1.52	x Base Rate
81	= 1.21	x Base Rate	97	= 1.37	x Base Rate	113	= 1.53	x Base Rate
82	= 1.22	x Base Rate	98	= 1.38	x Base Rate	114	= 1.54	x Base Rate
83	= 1.23	x Base Rate	99	= 1.39	x Base Rate	115	= 1.55	x Base Rate
84	= 1.24	x Base Rate	100	= 1.40	x Base Rate	116	= 1.56	x Base Rate

On the pay slip, the total time was recorded for each employee; then the lapsed time of all sorts, kept by each department, was deducted from this figure to give Actual Time Taken. The operative's efficiency for the week was then this figure divided by the time study standard figure—Time Allowed. The money received was in two parts: bonus wages and lapsed time wages. The bonus factor for the week being determined from the table, the base rate was multiplied by the factor and by the Actual Time Taken—to give the bonus wages. Lapsed time wages were figured in the same way for the lapsed time hours.[2]

The table of bonus factors was constantly brought before the operatives, and every attempt was made to familiarize them with the plan. The fact that each increase of 1% in efficiency brought an exactly similar increase in the the factor made it easy for each operative to figure her bonus factor for the week. The system also resembled in this way the former system of piece-rate payment. The method of figuring the factors also allowed the production of goods above the amount required for 70% efficiency at a constantly decreasing unit cost to the management. The table shows that for an increase of efficiency from 70% to 71% the factor increased from 1.10 to 1.11, while an increase in efficiency from 115% to 116% brought an increase in the bonus factor from 1.55 to 1.56. If we divide 70 into 110 and 115 into 155, it will be seen that the ratio of payment in the lower range is 1.57 to 1.35 in the higher. This ratio would of course be different at each point of comparison. In this particular comparison, with a 32 cent base rate, the operative would be paid $2.41 more in a 48-hour week for a 71% efficiency than for 70%, and only $2.07 more for a 116% efficiency as compared with 115%. This reduction in unit cost was of course increased by the fact that overhead of the plant could be spread over a greater number of pieces when the increase was due to the higher efficiency of operatives alone. To the workers, however, the ratio of increase in pay was constant throughout the scale of efficiencies. The principle of efficiency had been to apply to the payment of the apprentices, with this difference: a special schedule of pay had to be worked out, in which a specific weekly wage rather than a bonus factor corresponded to the efficiency attained. For the operation of seaming, upon which this problem is based, this schedule of weekly pay began at $12 and was gradually increased until the apprenticeship period was ended, when the operator received the base hourly rate of 36 cents, or $17.20 for the 48-hour week. She also became eligible for the bonus which was paid when 70% efficiency was attained. In order to learn the seaming operation properly, all workers had to go through a training period of 16 weeks.

Upon analyzing the situation, the employment manager unearthed two important facts: (1) The apprentices quit somewhere between the fourth and the ninth weeks of their employment; (2) Apprenticeship efficiency did not increase in a straight line, as was formerly supposed, but in a curve, and at a rate steadily decreasing each week. A further inspection of the operations

[2] The fact that lapsed time—i. e., losses for working time for which management was responsible—was paid at the same bonus rate would act as an incentive to the management to eliminate causes of such delays. Accurate record was kept of the wages paid out on lapsed time, and the particular reasons in each case. Any increase in the ratio of lapsed time paid for would call for a check on the technical control of the mill.

showed that the more rapid increase in efficiency at the start was due to the ease with which the apprentices learned to handle the materials, and that the slower increase as time went on could be traced to the difficulty which the operators experienced in learning to run the machine properly. Continued breaking of the thread on the lock-stitching machines caused a loss of time, which in turn resulted in a lower efficiency. Since the wages depended upon the actual efficiency attained, slow increases in efficiency meant a small increase in the weekly wage. This the employment manager decided was the reason for the high rate of turnover in apprentice labor.

To remedy this difficulty, she made the rate of wages increase, not in proportion to the increase in efficiency, but at the point at which increases in efficiency were becoming difficult for the employee. The chart and table on this page will serve to illustrate this point more clearly.

The theoretical efficiency, obtained from a study of the piece-work wages

Stockland Mills. Apprentice Record

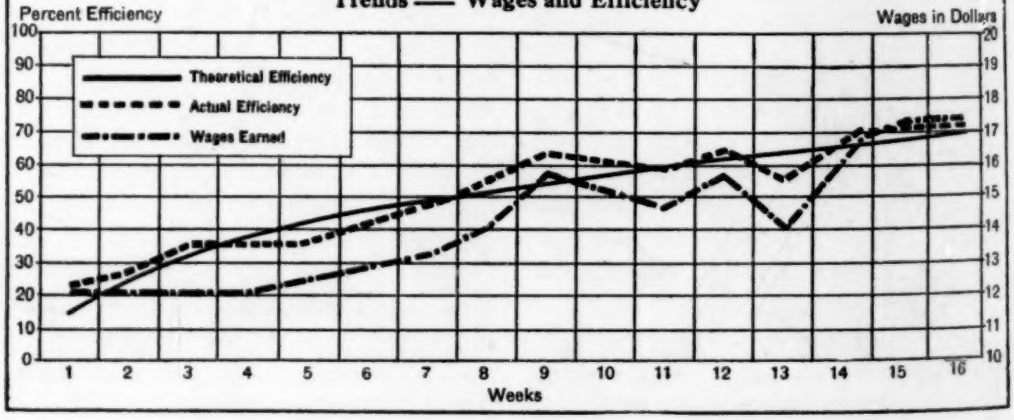
Name Sadie Smith — **Shop No.** 2

Date	Week	Hours	% Efficiency Theo.	% Efficiency Actual	New Pay Theo. Rate	Pay Actual Rate	Pay Actual Pay
5-27	1	48	15	22	12.00		
6-3	2	30.4	25	26	12.00		
6-10	3	48	32	34	12.00		
6-17	4	48	38	34	12.40		
6-24	5	41	42	35	12.80		
7-1	6	43.7	46	40	13.20	12.80	11.64
7-22*	7	48	49	46	13.60	13.20	13.20
7-29	8	41	52	54	14.00	14.00	14.00
8-5	9	48	55	63	14.40	15.60	15.60
8-12	10	48	57	60	14.80	15.20	15.20
8-19	11	48	60	58	15.20	14.80	14.80
8-26	12	37.6	62	63	15.60	15.60	12.90
9-2	13	48	64	54	16.00	14.00	14.00
9-9	14	39.3	66	69	16.40	16.80	13.76
9-16	15	48	68	70	16.80	17.20	17.20
9-23	16	48	70	71	17.20	Bonus	
	17						
	18						
	19						
	20						
	21						
	22						
	23						

Education: 2 Years' High School
Nationality: American
Age: 21
Previous Experience: None
Operation: Seaming
Base Rate: 36¢
Train. Period: 16 Weeks
Pay Schedule: A
Date Started: 5-27-22
Apprenticeship Terminated: 9-23-22
Length of Apprenticeship: 16 Weeks
Transferred: 9-23-22 to Women's Seaming
Left:
Remarks: Paid first 5 weeks on old basis, then shifted to new basis

*Entire plant given 2 weeks' vacation 7-1 to 7-22

Trends — Wages and Efficiency



of apprentices over a year's period, and the actual efficiency of one apprentice who is representative of the group at this time, are shown as based on the scale at the left-hand side of the chart. The wages received by that same apprentice are based on the scale at the right-hand side. It will be seen that even though the efficiency increases markedly at the start, there is not a commensurate increase in the wages paid, but that as increases in efficiency drop off, the wages rise rapidly. This the employment manager considered to be the solution of her problem.

Analysis of the Method

An analysis of the case has led to the conclusion that, not only will the employment manager's solution fail to improve the situation, but also that the present method of paying the apprentices will continue to be a contributing factor in causing the high rate of turnover among the new workers. The nature of the conclusion suggests a consideration of the problem under three headings: (1) a discussion of the employment manager's plan; (2) a discussion of the weaknesses of the efficiency method of wage payment when applied to apprentices working under conditions that existed at the Stockland Mills; and (3) a proposal for an entirely different wage system for apprentices under those conditions.

The employment manager, in trying to remedy the apparent defect that she discovered in the incentive scheme, seems to have overlooked any other effects that such a change in the pay schedule might have had on the worker. By a study of the actual record of one apprentice, as shown in the chart, two possible reactions on the part of the worker are revealed. They will not, of course, be felt by every one who is hired, but they will probably be as potent as the defect which the employment manager is trying to remedy at the present time.

The first of these two possible reactions, if it appears, will show itself during the first four weeks of the apprenticeship. From the beginning, the worker will know in a rough way that her wages depend on the amount of work done. Because of the ease in which she learns to handle the materials, her production will increase rapidly, but her wages will not increase commensurately. Right here would seem to be a source of discouragement for as many girls as were formerly discouraged after the fourth week.

The second reaction would come as a result of the rapid increase of wages from the fourth week on. This rapid rise in the pay would probably accomplish an unwelcome result beyond its intention. The increased earnings, coming suddenly, may give some of the workers the idea that there are many more such earnings if they can build up their efficiency rapidly. To do this, a worker so affected will try to increase her production faster than her acquaintanceship with the machine permits. Spoiled pieces, which have to be done over, cause production to drop off, and, as a result, wages. For the girl to try to make up the time lost means that production will continue to suffer, and the aim of the company is defeated—i. e., the development of real skill.

The chart on page 244 will serve to make clear the preceding discussion. For this operator, who is representative, efficiency reaches a peak in the ninth week. The tenth week finds her trying to increase her production, but time consumed in going over spoiled work due to haste causes her efficiency to drop off.

The further drop in the eleventh week may be interpreted to mean that she has proceeded slowly in order to master the machine, for the rise in the twelfth week would seem to indicate that the increased mastery was bringing results. The thirteenth week is so far out of line that it suggests some individual condition. But the fourteenth week is 6% higher than that of the twelfth. From the fourteenth to the sixteenth week, the increase is gradual until the worker becomes a bonus operator in the final week of her apprenticeship. The fact that the worker finds it difficult to gain the skill required by the operation, and the fact that wages are practically paid for the amount of work done, would seem to point out this interpretation of the chart as logical.

Weaknesses

In favor of this plan of payment, it can be said that payment on the basis of an efficiency percentage, even if there is no bonus factor involved, helps the worker to understand the tie-in of the bonus with the rate of efficiency, after she becomes eligible for the bonus. She will get used to figuring her own efficiency and to being paid on such a basis, and the transition from apprenticeship to the class of bonus operator will be made with less trouble and misunderstanding. The weaknesses of the plan, however, are of such nature that they appear to outweigh this one advantage.

In the first place, an apprenticeship period of fixed length for any and all applicants is open to criticism, on the ground that aptitudes vary among different workers. Where some girls would require the entire 16 weeks, others could become expert in less time. The sooner an apprentice becomes a bonus earner, the more contented and more valuable to the company she will be. There is this to be said in support of the fixed term: Ample time would be given the worker to master the machine, which is the result the company seeks. But, on the whole, as long as there are apprentices, there will be some who can make rapid progress in their trade and others who will require a longer time to grasp the fundamentals. Particularly is a somewhat elastic term desirable in this case, where the worker expects to become a bonus operator.

Secondly, there is doubt as to whether payment based solely upon efficiency, which, in this instance, means practically the *amount* of work done, is compatible with the aim of the company in hiring and training girls to become highly skilled operators. To get the proper degree of speed in production, expert handling of the machines is necessary. Practice in learning to do this, not physical production, should be the slogan of the training period, and wages should be paid in a way which make them independent of the production gotten out, so that the worker may feel that, if she is a little bit slow because she is painstaking, still she will not be getting small wages as a result. The present system of the efficiency wage tends toward quantity of production at a time when the knowledge of the machine does not permit or warrant it. The fixing of this wage to correspond to the various efficiencies is a delicate proposition involving a nicety of adjustment between two conflicting factors, namely: the proper incentive to keep the worker on the job, and the necessity for complete mastery of the machine, which comes only with practice.

Finally, any graduated method of apprentice payment is likely to discourage many girls from even applying for the job. Too low a wage at the start keeps

many away. To teach a woman a skilled trade is more difficult than to teach a man. Most men expect to make their living out of one trade for the rest of their lives, and are willing to take low wages for the sake of careful training. Women, because of marriage, have a different attitude. A girl may engage in a great variety of other occupations in which the pay will be uniform from the start. Since she does not, as an ordinary thing, expect to make her living for the rest of her life and desires spending money above the cost of living, the mill is going to have difficulty to a certain extent in recruiting apprentices unless it pays them a decent wage from the beginning. This also seems to be a contributing cause to high turnover. Yet, women are the logical operators of the bulk of the machines in the mill, and because of this, there will always be a long-time tendency to turnover due to marriage, which must be provided for by an adequate number of apprentices. High turnover in apprentice labor does not contribute to this result.

To conclude, this seems to be a case where the method of payment, while not an end in itself, as so many elaborate wage schemes are, is a means to a wrong end, i. e., quantity of production. The true end, complete mastery of both materials and machines, is not attained under the present method. However, this conclusion is not to be construed as being unfavorable to the efficiency bonus system for the payment of the skilled worker. Once the required amount of training has been completed, there is an opportunity for an added incentive to increase production, and an efficiency bonus plan such as that of the Stockland Mills will accomplish the result as well as any other incentive scheme. When production is the end in view, such a plan of payment is a logical means to that end.

An Alternative

A suggestion for a method of paying the apprentices that will fit in with the needs of the mill is in line with the trend of the preceding discussion. Such a method, in order to be worth notice, would of necessity correct the weaknesses pointed out in connection with the plan of wage payment as practiced at present by the company. A plan has been worked out by one or two concerns which will correct those weaknesses, and still be of service in furthering the aims of the mill as regards training.

Under this proposed method, the wage paid to apprentices is split into two parts. The first, the "expectancy," as it is called, is a rate per piece, and is what the girl actually earns. But, because the girl cannot earn enough at first to pay her expenses of living, the company tacks on what is called the "retainer." The two added together make the total wage, which does not handicap the girl at the start, but gives her a feeling of security in her new job. As she progresses, the "retainer" goes down, and the "expectancy" increases; that is, the guaranteed rate decreases while the standard of performance is raised, until, at the end of the period of training, the guaranteed rate (the "retainer") disappears and the girl is on a straight piece-rate basis.

This system as outlined could be worked out at the Stockland Mills. The employment manager already has sufficient data at hand (the piece-rate earnings of apprentices for the period of a year, from which she obtained her theoretical efficiency) to assign the "expectancy" for each week. With this as a base, the "retainer" can be computed

for each week, so as to bring the weekly wage up to the base rate, which is 17.20. The "retainer" is not changed, nor is the rate per piece. Variation in wages comes only through the channel of work produced. Two girls starting together get the same "retainer" week by week, but one may receive a larger envelope at the end of the week because she learns faster and as a result produces more. But, the guaranteed rate relieves her of the necessity of producing at a speed (in order to make a high wage) that will result in spoiled work and lack of attention to the fine points of machine operation.

Furthermore, provision for shortening the apprentice period in individual instances can be made under this new arrangement. The employment manager can easily determine the aptitudes of the different workers, and distinguish between them. She can be surer under this method that increased production has come from a more thorough acquaintance with the machine on the part of the apprentice.

Thus, the chief weaknesses of the present method, as discussed above, could be ironed out under the proposed method. Not only is the girl paid for what she does, which serves as an incentive to steady advance, but also she is told to learn and is paid for it. A record of her production will show whether she is loafing in order to get the "retainer." Her time will be spent in absorbing the tricks and intricacies of successful and proper machine operation, so that, when she steps into the bonus operative class, she will be able to maintain a steadiness of production that will net her a weekly bonus and make her contented in her work. The end in view would thus be attained. The apprentice would have no opportunity to be discouraged, and the company would get its highly skilled operatives.

REVIEWS OF BUSINESS LITERATURE

De Haas, J. Anton. FOREIGN TRADE ORGANIZATION. *New York: Ronald Press Company, 1923. 378 pp. $3.*

Foreign Trade Organization is the most recent volume upon international trade by J. A. de Haas, Professor of Foreign Trade in New York University. The author presents the subject from the broad viewpoint of one who is primarily interested in the reasons for the development of trade between nations and the factors which contribute to its continuance, rather than the actual technique of foreign selling. The statement made in the chapter on Transportation, Chapter IX, page 180, may well be applied to the entire treatise:

> We are here only interested in studying how means of communication serve to facilitate the flow of goods, and the influences which are at work to hamper or to encourage the service.

The treatment of the subject from this aspect ranks the work as a good companion volume to Wyman's *Export Merchandising* and Hough's *Practical Exporting.*

The author deals with the external organization of the foreign marketing structure and not with the practices of individual concerns. Although in some cases possible future developments are indicated, the general underlying principles and fundamentals are outlined primarily as they affect present organization. The historical background leading up to the organization of today is given for each component of the subject presented. Leading American practice is considered in contrast with practices in European countries and other parts of the world. The knowledge which Mr. de Haas possesses of a number of languages has enabled him to write a book which includes a great deal of material not heretofore available for the American reader.

In addition to numerous references to source material, a very complete bibliography of the works upon international trade and related subjects, together with a list of the most important publications at United States banks and sample fairs, is included.

The author begins his work by treating of the factors in international competition. He goes from this subject to the present foreign trade statistics, taking special pains to point out their inadequacy. Tariffs and their effect upon trade are next considered; then governmental trade promotion agencies, such as consular services, the diplomatic corps, trade bureaus and chambers of commerce. Expositions, fairs, exhibits, commercial museums, and other miscellaneous trade-promoting agencies form the next group of subjects; transportation and communication are also discussed. The various world differences are outlined and certain unsatisfactory features pointed out.

The organization of the world markets for raw materials is another major topic. The many different methods of sale are enumerated, price influences are outlined, and other devices which are used to facilitate trade are discussed. Under the heading of "Foreign Traders" the author treats of the various middlemen and the channels through which trade may move between countries. The conclusion deals with the legal position of commercial concerns abroad as contrasted with that at home.

Douglas, Hitchcock, and Atkins. THE WORKER IN MODERN ECONOMIC SOCIETY. *Chicago: University of Chicago Press, 1923. 929 pp. $4.50.*

The authors are members of the faculty at the University of Chicago School of Commerce, where the development of a case-and-problem presentation of subject embodied in the curriculum has been going on for some time. After class-room experimentation with the material collected, that found most appropriate has been presented in book form. As a result, this volume is essentially a selection of readings from the works of authorities and those engaged in research in the field of labor. The extracts are copied verbatim, so that the champions of various causes are "allowed to speak for themselves." Hence, the material is not presented in the usual text-book fashion.

While this collection of readings was designed primarily as a text for class-room study in the field of management and labor, it seems to us equally valuable for the layman and employer, for here in one volume the reader may obtain a "literary digest" of what has been written regarding the moot questions arising from the relations existing between employer and employee, and capital and labor.

With the purpose of giving the reader an economic and psychological background for the later material of the book, the early chapters are made up of extracts from those fields. Some of the articles are of an "ethereal" type and may leave the mind of a layman in a clouded condition. While this has its advantages, it would seem that the treatises dealing with the practical phenomena of these sciences (such as Professor James' famous chapter on Habit) could advantageously have been quoted more at length.

The second part of the book emphasizes the restlessness of human society. After a series of selections dealing with "various schemes of economic organizations," the reader is given a rapid but well-arranged glimpse of the Industrial Revolution. One of the included articles treats a specific example of this development in the boot and shoe industry.

The third part deals with the worker in his relation to the market. Here are discussed bargaining factors, the influence of the business cycle, immigration, wages, economic remuneration, distribution of wealth and income, women's work and wages, hours of work, and the like. A chapter is given to the Bituminous Coal Award of 1920, a concrete case of wage adjustment.

Part Four, on "Security and Risk," considers the causes and consequences of accidents, diseases and sickness, old age, unemployment, insurance, and workmen's compensation acts. All these are the outgrowth of the relationships discussed in the preceding division. The trade union, which is discussed in Part Five, is a similar outgrowth. The early chapters on this subject give reasons why men join unions. Following this is a section on the historical development of unionism in the United States. Union policies and methods are treated quite at length.

Part Six shows the other side of the picture by describing some of the labor policies adopted by management. Four methods and agencies are discussed, namely: employers' associations, employee representation, wage payment and scientific management, and profit sharing. The last part is devoted to a discussion of the reaction of society to the conflict between capital and labor. The materials and readings in this part are concerned chiefly with protective legislation, court interpretations, and the

methods whereby society seeks to secure industrial peace.

Hastings, Hudson Bridge. COSTS AND PROFITS. *Boston: Houghton Mifflin, 1923. 168 pp.* $2.50.

Costs and Profits is the third volume published by The Pollak Foundation for Economic Research; the author is Professor of Administrative Engineering at Yale University. Mr. Hastings endeavors to reach conclusions relative to the underlying causes of the business cycle. This he accomplishes by means of an accounting analysis of current business procedure from the angle of Costs and Profits.

The study was suggested by the theory held by some students that the sale price of goods offered to consumers in periods of business activity exceeds the money which consumers have available for expenditure; this condition leads to an accumulation of inventories and provides the proper setting for a business crisis. As a result of the study the author reached the following conclusions:

1. In periods of business activity business concerns as a whole do not disburse an amount of money equal to the sum of the sale value of their product and all money received from outside sources.

2. Three influences—forward buying, speculation, and the tendency of dealers to keep stocks commensurate with sales—combine to bring about the relative overdevelopment of those industries, which produce tangible goods intended for the satisfaction of individual wants, and an almost continuous advance in prices.

3. There is an accumulation of goods held for speculation.

4. Savings and profits are again used in the production of new goods for the consumer market before they are put into the hands of the ultimate buyer to increase his purchasing power.

5. There is a lag in the flow of interest and profits into the hands of ultimate buyers because of the intercorporate ownership of securities.

The author's contention is that all five of the above factors tend to produce the same result, namely, a constant increase in the total amount of stocks of unsold goods. These stocks are far in excess of the amount commensurate with the secular growth of business. Because of the absence of accurate information concerning the volume of production and sales to ultimate buyers, the resulting accumulation of unsold goods takes place on such a large scale that a commercial crisis is inevitable.

He continues, however, "It does not follow that the removal of the above factors would result in sustained maximum activity. The variation of crops, tariff changes, trade changes due to national and international competition, wide-spread changes in the character of demand due to changing tastes or legislation, and (other) similar factors will always produce situations to which business cannot adjust itself without some disturbance. But, in the absence of the five underlying factors, the variations in business activity due to intermittent causes, or the possible effect of the secular growth of business, would in nearly all cases be slight compared with the wide swings we have experienced in the last 50 years."

The chief contribution of the book to current economic literature is a sound analysis of our extremely complicated methods of business and a clear defini-

tion of the relation of this procedure to cyclical movements in business.

The author's suggestion, based upon the conclusions presented above, is that a wide-spread dissemination of knowledge concerning current production, stocks on hand, and current sales would tend to alleviate the severity of recurrent business crises.

Because of the nature of the material presented, the book is not easy to read. However, the author continually crystallizes interrelated expositions into simple, complete proofs which bear directly upon the thesis. The business executive who is interested in the underlying causes of business phenomena will find himself well repaid for the time and mental effort spent in reading the book.

Herrold, Lloyd D. ADVERTISING FOR THE RETAILER. *New York: Appleton, 1923. 677 pp. $5.*

Mr. Herrold in this book has considered all types of retail advertising. Several other writers have covered only particular phases of it.

The first value of Mr. Herrold's work lies in the recentness of the advertising material he has used. In the past few years advertising has made such strides that books written only a few years ago would prove of small value to the present-day retailer. But more important from the retailer's standpoint is the new approach to the subject which he has found advisable. He contends that the first consideration of the average retailer is the amount of money he can afford to spend on advertising. The order of presentation has been arranged with this fact in mind, rather than from the standpoint of an ideal academic approach. He finds four steps necessary in the preparation of a retail advertisement: (1) the selection of the goods that are to be advertised; (2) the analysis of the goods to determine their selling points; (3) the preparation of the layout; (4) the actual writing.

The field is covered under five general classifications: newspaper, direct, outdoor, street-car, and store display advertising. A wealth of material collected from retail stores during the past few years is brought to the study. This is freely used to illustrate certain points and should be of great aid in enabling the retailer to visualize the application of his suggestions to actual copy. In discussing the preparation of layout, a great deal of matter is introduced on the mechanics of display, such as type faces, printers' terminology, and methods of reproduction. Much of this is a repetition of material found in general books on advertising, but should prove none the less valuable.

The discussion of direct-advertising media includes a treatment of business and sales letters as well as the usual folders, catalogs, and store newspapers. The section devoted to store display contains some unusually interesting points on the value and fundamentals of window display.

Throughout the book a special appeal is made to the retailer in the small city or town, where advertising has not attained so high a standard as in the larger cities. Too many retailers, says the writer, either have not been made to realize the value of advertising or have failed to approach it in an intelligent manner. Retailers, especially in small towns, can greatly widen the radius of their marketing area by properly directed and well planned advertising campaigns.

The book is so arranged that it should prove valuable both to the retail advertiser as a guide in the preparation of his actual material and to the student of advertising as a text-book.

BOOK NOTICES

Berridge, William A. CYCLES OF UNEMPLOYMENT IN THE UNITED STATES, 1903-1922. *Boston: Houghton Mifflin, 1923. 88 pp. $1.25.*

In this study, which was awarded the first prize in a contest conducted by the Pollak Foundation for Economic Research, Dr. Berridge has contributed to our exact knowledge of the unemployment problem. He has taken employment data of the United States Bureau of Labor Statistics and of various state commissions and has constructed out of them general indices of employment. The index which, in the author's opinion, constitutes the most reliable current measure of the general employment cycle in the United States, is the average of the indices of the United States Bureau of Labor Statistics and the New York Industrial Commission. The principle employment indices have been studied in comparison with indices of production and of other series representing the volume of business. The close agreements found afford evidence that employment is a highly satisfactory index of industrial cycles both before and since the war.

Bishop, Avard L. OUTLINES OF AMERICAN FOREIGN COMMERCE. *Boston: Ginn and Company, 1923. 321 pp. $3.*

The author covers in a general and non-technical way the fundamental factors underlying American foreign commerce. In a brief survey the natural resources of the country and the industries based on these resources are shown in their relation to foreign commerce. The comparative importance of the domestic trade is emphasized and the future of American export and import trade is discussed in the light of simple economic factors. Some space is devoted to a non-technical discussion of transportation, marine insurance, and financing. A chapter on policy contains a résumé of tariff policies of various countries and a prediction that a revival of protection is imminent.

A chapter on the promotion of foreign trade summarizes the work of the various departments and organizations which aid in trade promotion both in this country and in the principal European countries. A very comprehensive bibliography of books and articles on foreign trade and commerce is included.

Brown, D. L. EXPORT ADVERTISING. *New York: The Ronald Press Company, 1923. 342 pp. $4.*

The author is the manager of the advertising department of The Goodyear Tire and Rubber Export Company; he presents the book as the result of some 20 years' experience in this field. It is hardly a thorough treatise on the subject, being more in the nature of a compilation of experiences and suggestions. A chapter on the advertising methods of several leading American firms in their foreign trade is very interesting. There follow sections on the organization of an export advertising department, the use of an agency, and all the usual discussion in regard to methods. A number of actual forms and records are included.

Bureau of Foreign and Domestic Commerce. TRADE ASSOCIATION ACTIVITIES. *Washington: Department of Commerce, 1923. 368 pp. 50 cents.*

This book is of a different nature from other recent publications on the subject. It is a compilation, made from a wide variety of sources, of all data relating to the work and influence of trade associations. The Bureau recognizes that no such treatise can long remain complete and plans to revise the volume at a later date. Emphasis is laid on the legitimate value of statistics to smaller members of associations; there are sections on cost accounting, credits and collections, standardization, trade codes of ethics, employee relations, transportation, and relations with the public. The whole last half of the book is a description of governmental departments from the angle of their helpfulness to any private association. Mr. Hoover says in his introduction "The material in this book has been brought together not from the point of view of educating big business, but with the idea that the legitimate trade associations and other forms of business coöperation are the real basis for promotion of smaller businesses."

CROWELL'S DICTIONARY OF BUSINESS AND FINANCE. *New York: Thomas Y. Crowell Company, 1923. 608 pp. $3.*

The word "dictionary" is hardly sufficient to describe this volume. Many of the articles are several hundred words in length. All im-

portant business and financial as well as many legal phrases are explained with a minimum of technical language. Related subjects are cross-referenced to aid the reader in securing most complete information on any subject.

An appendix to the dictionary contains information on a wide variety of subjects. A discussion of the monetary system of the United States, a comparison of the value of foreign coins with United States money, interest tables, bond interest tables, and income tables are found in this section.

Droppers, Garrett. OUTLINES OF ECONOMIC HISTORY IN THE NINETEENTH CENTURY. *New York: The Ronald Press Company, 1923. 286 pp. $2.50.*

Although this book was written primarily for students, it is equally valuable to the business man who desires to understand more fully the economic period in which he lives. The author attempts to make clear the historical background of the present economic and industrial situation by outlining the series of events which have shaped it. The discussion is started with the year 1763; it brings into consideration the major influences which have operated in the United States, Great Britain, France, Germany, and Italy. Section headings make the book easy to read. Frequent references to economic literature contemporary to the period under discussion will aid those who care to pursue the study further.

Gowen, Bernard C. APPLIED PSYCHOLOGY. *New York: Macmillan Co., 1923. 480 pp. $2.50.*

The title immediately suggests a field of almost unlimited extent. But the last one hundred pages, dealing with Industry and Commerce, comprise the only part in which the ordinary business man will find discussed the psychological phenomena applicable to his every-day affairs. There are very few new contributions to the science of business. Many facts and principles are, however, presented in a logical arrangement and with such clearness as to render them easily understood by the layman.

Hobson, J. A. ECONOMICS OF UNEMPLOYMENT. *New York: Macmillan, 1923. 157 pp. $1.75.*

Professor Hobson, a liberal English economist, presents in this study a statement of his own theory of unemployment. In his view, industrial depressions and concomitant unemployment are the result of a normal tendency for consumption to fail to keep pace with industrial production. This tendency leads inevitably to periodic gluts of commodities and consequent stoppages of the productive machinery. Belief in this doctrine is one of the chief causes of restriction of output as practiced by both workers and capitalists.

The reason for the chronic state of underconsumption is found in over-saving; unduly large shares of general income fall to the rich and the surplus over ordinary spendings finds its way into capital accumulation. This disproportion between saving and spending can be remedied only by a redistribution which will absorb the unearned and unneeded incomes of the rich, partly by higher wages and standards of living for workers, and partly in increased expenditures by the state for public purposes.

The better distribution of income which will thus be secured will reduce the proportion though not the amount of saved income. The freedom of the activity of the industrial machinery from cyclical fluctuations will result in an increase in real income such that a smaller proportion of saving will yield new capital in quantity at least equal to that heretofore accumulated. The more regular working of the industrial system will tend also to confine speculation and expansion of credit within narrow limits and thus minimize the effect of one of the principal factors which has accentuated cyclical fluctuations in the past.

Professor Hobson, in short, finds the roots of irregularity of industry in the defects of distribution of the general income and not in the miscalculations of business management or in the aberrations of the systems of money or of credit. Only by a change in the methods of distribution, he holds, can fluctuations of industrial activity and of employment be prevented.

Hopkins, Claude C. SCIENTIFIC ADVERTISING. *Chicago: Lord and Thomas, 1923. 102 pp. Free to executives.*

This small volume is an attempt to present in a few pages the importance of applying scientific methods to advertising. The fundamentals and general principles which should govern all advertising are discussed, rather than the actual technique of writing "scientific" copy. Every chapter stresses the neces-

sity for testing advertisements by means of coupons, keys and other means, regardless of the size of the advertisement or its intended circulation. The author contends that advertising is just another form of salesmanship and that many practical advertising lessons can be drawn from actual salesmanship and mail-order selling.

Kyrk, Hazel. A THEORY OF CONSUMPTION. *Boston: Houghton Mifflin Company, 1923. 298 pp. $2.50.*

The principles of economic theory as applied to production, value, and distribution have been discussed from many angles by a multitude of writers. There has been incidental mention only, if any at all, of the rôle of the consumer in our economic organization. Dr. Kyrk, in her book, *A Theory of Consumption,* deals with this question. The problems discussed include those of consumers' motives; how the consumer is restricted in his choice of commodities by the limitations of income; how the producer affects the consumer's choice through control of prices; what constitutes a standard of living; and what agencies can assist most effectively in setting standards by which the consumer can regulate his choices. This volume is one of the books in the series of Hart, Schaffner and Marx prize essays in economics.

Moore, Henry Ludwell. GENERATING ECONOMIC CYCLES. *New York: The Macmillan Company, 1923. 141 pp. $3.*

Professor Moore has expanded somewhat the articles on the causes of economic cycles which appeared in the 1921 numbers of the *Quarterly Journal of Economics.* The author seeks ultimate rather than proximate causes for the periodic fluctuations of industry. He attempts to prove that there have been eight-year industrial cycles coincident with rainfall and crop cycles of equal length. He suggests that the causes of this congruence of the economic and meteorological fluctuations "must be sought in a cosmical cycle. The probable cause is the planet Venus in its eight-yearly periodic motion with respect to the Earth and the Sun."

Morgan, Charles Stillman. THE REGULATION AND MANAGEMENT OF PUBLIC UTILITIES. *Boston: Houghton Mifflin Company, 1923. 362 pp. $2.50.*

The basic problem presented for analysis is whether the return upon capital engaged in furnishing public utility service can be strictly limited and yet have a high degree of productive efficiency. The principal conclusions reached by Dr. Morgan are that "public necessity requires, in the case of public utilities, the establishment of conditions which will specifically conduce to the maximum utilization of the agencies or means of production and that these conditions shall be such as stimulate and reward management, rather than capital as such, for superior efficiency." The author has tried to make the treatment real and complete for all classes of interested readers. In doing so, he has considered the five interests involved in the management of public utilities—the public served, the company-capital, the company-management, labor, and the regulatory agencies.

Moulton, H. G., and McGuire, C. E. GERMANY'S CAPACITY TO PAY. *New York: McGraw-Hill Book Company, 1923. 384 pp. $2.50.*

The authors have made an attempt to answer from an exhaustive study of available data the contemporary questions on the reparations problem. They have had the resources of the Institute of Economics (established by the Carnegie Corporation of New York) at their disposal. Official foreign figures have been used in many cases. Besides analyzing Germany's present position and her monetary difficulties, the authors point out certain general principles involved in this type of international payment. A short chapter is devoted to the methods used by France in paying the indemnity of 1871. This volume is one of a series to be published by the Institute staff.

Northwestern University Bureau of Business Research, Horace Secrist, Director. COMPETITION IN THE RETAIL DISTRIBUTION OF CLOTHING. COMMERCIAL RENT AS AN EXPENSE AND ITS RELATION TO PROFITS. *Chicago: Northwestern University Bureau of Business Research, 1923. 27 and 30 pp. $1.00 each.*

These studies are Numbers 7 and 8 in Series II of the publications of the Bureau and continue the examination of the retail clothing trade. The first deals with the expense or "supply" curve for retail clothing dealers —the position of the marginal producer com-

pared to normal. From data extending over a period of years, it demonstrates the constant shift in the make-up of the marginal element of dealers.

The second study is one presented by Mr. Secrist at the Thirty-fifth Annual Meeting of the American Economic Association in March, 1923. It is an analysis of the very important element of rent expense and its effects upon profits over a period of years.

Putnam, T. M. MATHEMATICAL THEORY OF FINANCE. *New York: John Wiley & Sons, 1923. 117 pp. $1.75.*

This book presents the fundamental principles of the mathematics of interest and annuities, bonds, amortization and sinking funds, probability, life annuities, and life insurance. There are included several useful tables and a wide variety of illustrative problems. Emphasis has been laid on the fundamentals and no attempt has been made to cover the technical details. Though prepared primarily as a text for business and commercial schools, it should be useful to anyone who desires a knowledge of the mathematics involved in the ordinary problems of business and finance.

Weakly, Frank E. "APPLIED PERSONNEL PROCEDURE." *New York: McGraw-Hill Book Co., Inc., 1923. 192 pp. $2.00.*

A number of specific phases of personnel management growing largely out of the author's own work as a personnel director are described in concrete fashion. The phases considered include sources of help supply, interview, selection, and placement, methods of recording labor turnover, attendance and punctuality, promotions and transfers, job analysis and job specification, employee training, health and personal service, and employee representation and profit sharing. An introductory chapter points out why a personnel department is necessary, and the whole subject is brought to a close by a discussion of the place of the personnel department in the factory organization, and of the necessary prerequisites to success.